SYSTEM CONTROL TUNER/DECK
OPTICAL DIGITAL REFERENCE SYSTEM

RS-K1

OWNER'S MANUAL

Thank you for purchasing the PIONEER ODR product. Please read this manual carefully before you start operation.
This manual contains information for the operation of the system. Please keep it in a safe place for future reference.

Welcome to the Optical Digital world.

Contents

How to use this manual

— Be sure to read through before use — iv

In order to obtain the best value from this system, read "How to use this manual," which contains advice on using the manual effectively.

Preparation and preliminary information 1
- Welcome to the world of optical digital sound 2
- Please read the following before using this unit 4
- Opening and closing the SYSTEM COMMUNICATOR cover 6
- Using the SYSTEM COMMUNICATOR as the remote control 8
- Front panel of the main unit 10
- Setting up the environment for use 13
- Entering characters in the edit mode 23

Be sure to read this section when using the system for the first time. It details procedures and checks which must be performed before anything else.

Operations

— Listening to the source — 25
- Turning ON the power 26
- Adjusting the volume 27
- Using the multi-CD player 29
- Using the tape deck 41
- Using the tuner 47
- Traffic information reception 58

First, perform common operations such as adjusting the volume and switching to the desired source (radio, tape deck etc.).
Having made the desired adjustments, listen to each sound source, and experiment with each source's convenient functions.

Audio adjustment 61
- Audio menu 62
- Main menu <MAIN> 64
- Equalizer menu <EQUALIZER> 79
- NAC menu <NAC>.. 89
- Network menu <NETWORK>..................... 104
- Memory functions of adjusted audio menu 117
- Display for the person who set up the audio adjustments.......................... 124

This section explains how to adjust sound quality using the audio unit's DSP function. Set the controls to produce the ideal balance for the vehicle, store the settings in memory and enjoy perfect sound.

Connection and installation........ 127
- Read this before connecting and installing the unit 128
- Connecting the units 132
- Installation 144

Read this section before connecting and installing, to ensure correct wiring.

Attachments................................. 155
- Troubleshooting 156
- Audio adjustment information 159
- Index by screen number/function 164
- Specifications 166

If there is reason to suspect a breakdown, read "Troubleshooting" before sending the unit in for repairs. "Audio adjustment information" includes examples of NAC adjustments and the memory data memo to enable the memory contents of the audio menu to be entered.
To find the desired operations in this manual, use "Index by screen number/function".

How to use this manual — Be sure to read through before use —

The sections of this owner's manual are organized according to the different features and functions of the system so that you can easily refer to necessary information. Make good use of this manual to fully enjoy all the advanced functions of the system. Welcome to the world of optical digital sound!

Symbols

The following three symbols are used in this manual.

⚠ CAUTION — never do this.

This symbol indicates dangerous action which must be avoided.

⊘ Note — follow the instructions carefully.

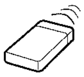
This symbol indicates action which can cause the equipment to fail if it is wrongly performed.

☞ Additional information.

This symbol indicates that further information is available, for example on limits specifications, cautions on operation, and techniques needed to make full use of the unit.

Operations performed in the closed state

— Marked with remote control icon —



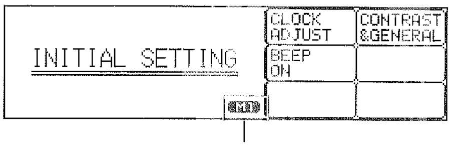
Which functions are available depends on whether the cover of the SYSTEM COMMUNICATOR is open or closed.
Operations marked in this manual with remote control icons can be carried out even when the cover is closed. (The operations can also be carried out by remote control.)

> Operations not marked with remote control icons can only be carried out with the cover opened. SYSTEM COMMUNICATOR must be placed in the base to make it connected.

Display of screen numbers

This system incorporates several types of modes, and operations are performed by switching to the appropriate screen. To help you understand this system quickly and become experienced in using it, the screen number corresponding to each mode is indicated on the display.

M1: Environment setup mode/Initial screen



Screen number

This manual illustrates screen numbers as follows, so that operations may be performed using the screen numbers shown on the display.

❖ When the screen number appears on the right side of the title

This explains how to switch to the screen number on the right.

Example:

Switching to the environment setup mode

Performing the operations that are being explained brings up this screen number.

❖ When the screen number appears on the left side of the title

When the screen numbers are on the left, the system explains the operations that can be performed.

Example:

M1 Turning the confirmation sound ON/OFF

When this screen number is displayed,
the operations being explained can be performed.

When operable screen numbers are not displayed

> First the screen must be changed. Using the screen number given on the right of the title, find your way to the required screen.

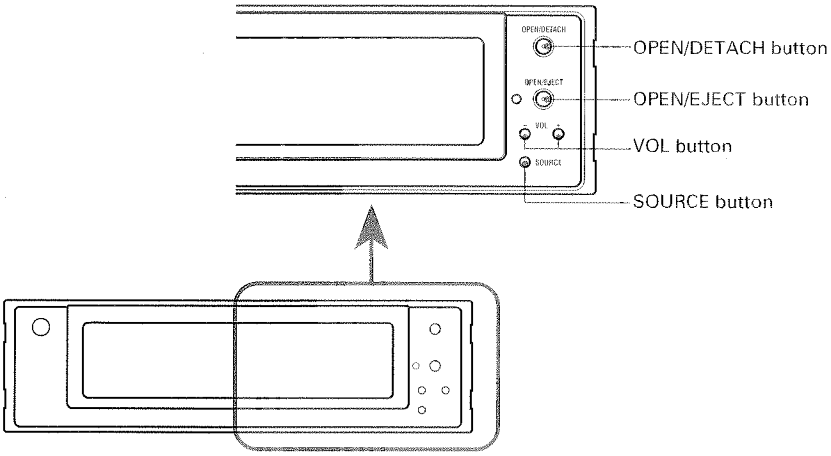
Performing operations using screen numbers

> See "Index by screen number/function" on page 164, as this includes information on performing operations using screen numbers.

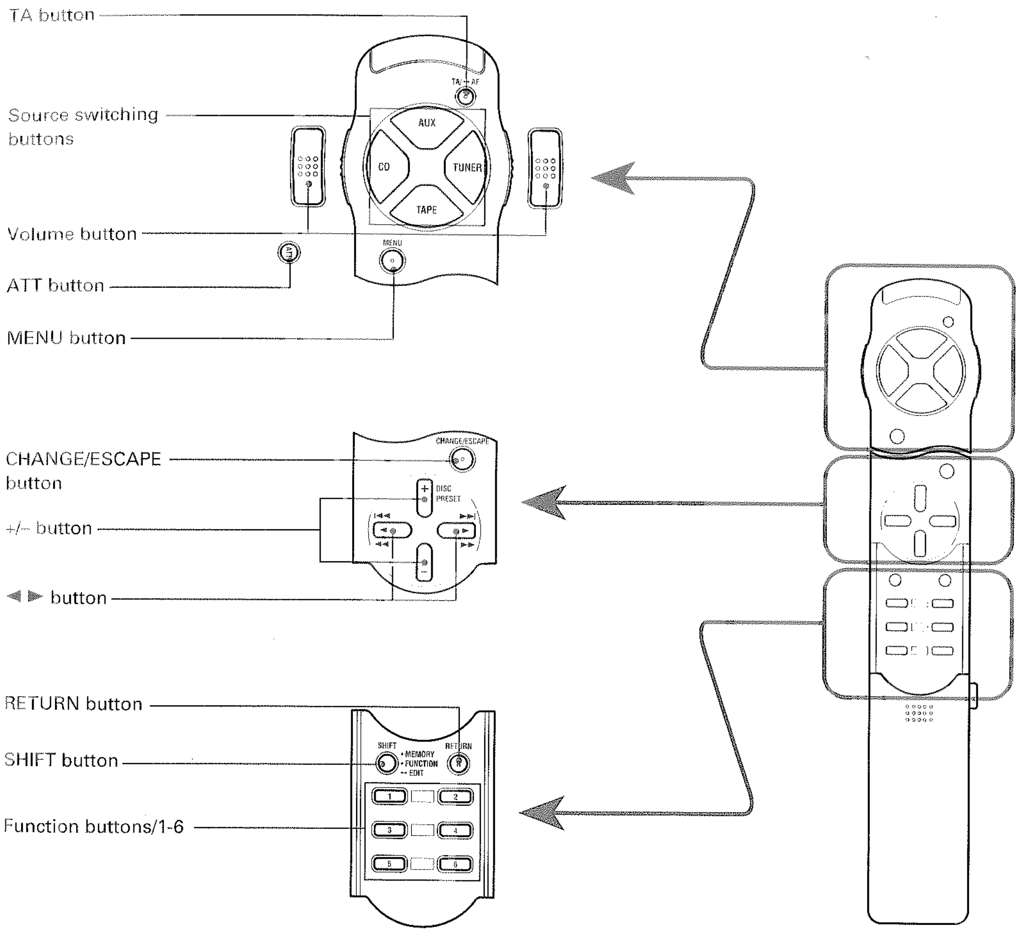
About the operating button illustrations

With this system, some functions can be operated on the main unit, most functions are operated using the SYSTEM COMMUNICATOR.
Buttons used for operations are shown in this manual as follows:

❖ SYSTEM CONTROL TUNER/DECK [RS-K1] (main unit)


OPEN/DETACH
OPEN/EJECT
- VOL +
SOURCE
OPEN/DETACH button
OPEN/EJECT button
VOL button
SOURCE button

❖ SYSTEM COMMUNICATOR


TA button
Source switching buttons
Volume button
ATT button
MENU button
TA
AF
AUX
CD
TUNER
TAPE
MENU
ATT
CHANGE/ESCAPE button
+/– button
◄ ► button
CHANGE/ESCAPE
DISC PRESET
RETURN button
SHIFT button
Function buttons/1-6
SHIFT
RETURN
• MEMORY
• FUNCTION
↔ EDIT
1
2
3
4
5
6

For opening and closing the cover

> For opening and closing the cover and for information on the connected and wireless remote control modes, refer to page 6 and 8.

Preparation and preliminary information

This section describes items which must be done and checked before using the system.
Check the supplied system and set up a suitable environment for the system.

CONTENTS

- **Welcome to the world of optical digital sound 2**
  - For better sound quality 2
  - What is the ODR System? 2
- **Please read the following before using this unit 4**
  - Precautions 4
  - Handling of the system 4
- **Opening and closing the SYSTEM COMMUNICATOR cover 6**
  - Opening and closing the cover 6
  - Menu displays with cover open and closed 6
- **Using the SYSTEM COMMUNICATOR as the remote control 8**
  - Removing and replacing the SYSTEM COMMUNICATOR 8
  - Setting batteries 9
  - Operating the SYSTEM COMMUNICATOR as the remote control 9
- **Front panel of the main unit 10**
  - Using open-and-close display 10
  - Using the removable front panel 11
- **Setting up the environment for use 13**
  - Switching to the environment setup mode 13
  - Setting the clock 15
  - Setting up the display contrast and the general environment 18
  - Turning the confirmation sound ON/OFF 22
  - Releasing the environment setup mode............. 22
- **Entering characters in the edit mode 23**

Welcome to the world of optical digital sound

For better sound quality — creating the perfect sound field —

There are a number of factors limiting sound reproduction in a vehicle. A vehicle differs from the home audio, for example, in shape, size, speaker location and noise from other electronic devices, and this creates a quite different environment for listening to music.

The ODR System was specifically developed to create an ideal sound in a vehicle, resembling the sound heard in more natural conditions.

What is the ODR System?

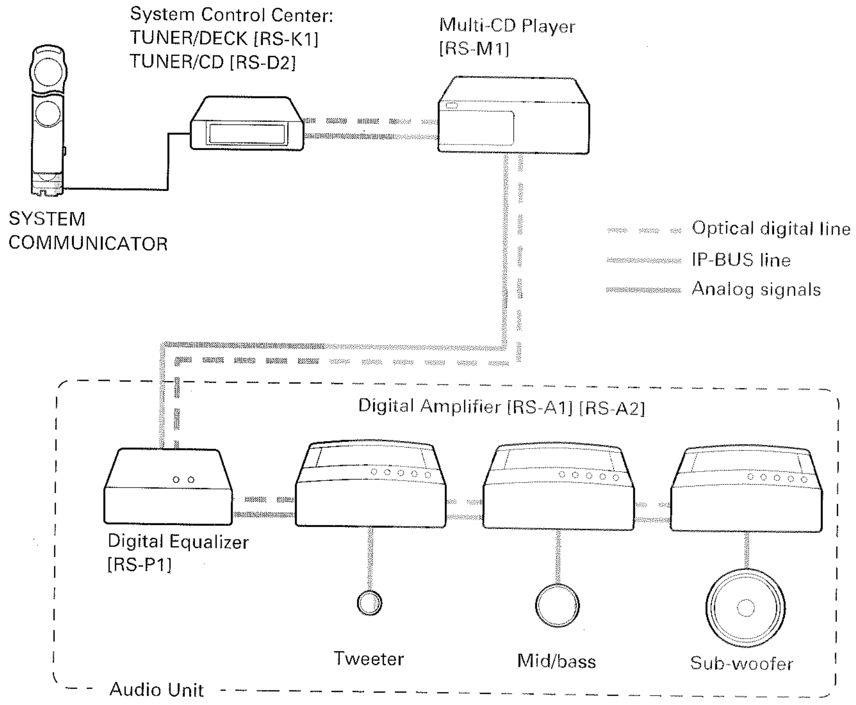
❖ Reproduction of high-fidelity sound by optical digital transmission

The ODR* System minimizes the loss of sound quality by relaying audio signals in optical digital form by optical cables all the way through the system to the power amplifiers.

Digital signals from the CD player are directly relayed to the next unit, while analog signals from the tuner and tape deck are converted into digital form before being relayed to the next unit. As digital signals are transmitted optically till just before speakers, which are the sound outlet, the system is able to reproduce sound without interference of noise from the power source and other noise from the vehicle.

* ODR = Optical Digital Reference

System setup example 1: Full optical digital transmission


System Control Center:
TUNER/DECK [RS-K1]
TUNER/CD [RS-D2]
Multi-CD Player
[RS-M1]
SYSTEM
COMMUNICATOR
Optical digital line
IP-BUS line
Analog signals
Digital Amplifier [RS-A1] [RS-A2]
Digital Equalizer
[RS-P1]
Tweeter
Mid/bass
Sub-woofer
Audio Unit

Communication method that facilitates upgrading of the system

The unique IP-BUS* is used for communication between units. This enables each unit to have data transmission, controls and thus various functions. It also facilitates upgrading to a large-scale system.

* IP-BUS = Interactive PIONEER BUS

Centralized control of all functions from within the vehicle

The System Control Center (TUNER/DECK or TUNER/CD)* controls all the functions of each unit. Actual operations of the buttons can be performed using the SYSTEM COMMUNICATOR. The large-scale LCD (Liquid Crystal Display) with 256 × 64 dots of the Control Center makes possible a rich variety of displays relating to the different functions.

The SYSTEM COMMUNICATOR can be used either installed and connected in the base or as a remote control unit by removing from the base. As it does not have to be installed on the dashboard, the SYSTEM COMMUNICATOR facilitate smooth operation.

* When RS-K1 and RS-D2 are combined, RS-D2 is controlled by RS-K1.

A rich range of sound quality controls possible only with digital signals — DSP —

The ODR System's Audio Unit (Digital Equalizer or Digital Amplifier) incorporates various DSP* functions using digital signal processing which make possible fine, delicate sound quality control. The functions can be switched by selecting the Audio Units to be combined.

Audio signals are processed in digital form. Therefore, loss of sound quality due to signal processing is minimal, ensuring the production of high-quality sound designed to match the resonance characteristics of the vehicle.

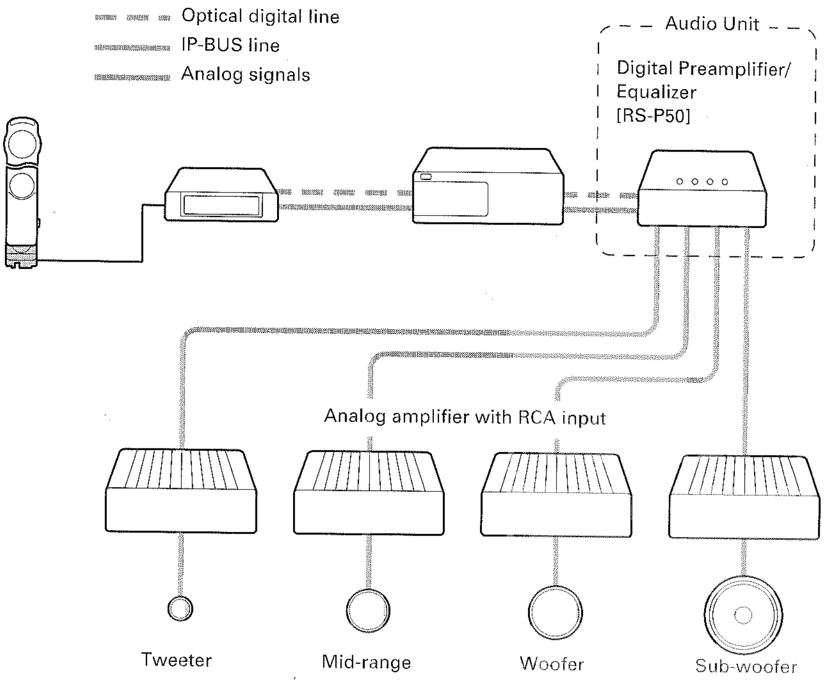
(Refer to page 61 for details on DSP functions.)

* DSP = Digital Signal Processor

It is also possible to combine analog amplifiers with RCA input

If you already possess analog amplifiers with RCA input, you can also set up the system using your analog amplifiers.

System setup example 2: Using analog amplifiers



Please read the following before using this unit

Precautions

- The "Pioneer CarStereo Pass" that comes with this unit can only be used within Germany.

Handling of the system

❖ When using the SYSTEM COMMUNICATOR connected. (Communicator installed onto the base):

⊘ Do not apply strong force to the connected part

- **Never apply strong force to the SYSTEM COMMUNICATOR during operation. Ignoring this may result in damage to the connected part between the base and the SYSTEM COMMUNICATOR, or cause connection failure.**
- **Avoid strong shocks to the SYSTEM COMMUNICATOR. Take care not to hit your elbow or knee to the unit.**

❖ When the car battery is removed

Removing the car battery resets the entire contents of memory (environment setup, tuner presettings, etc.) of this unit. Set the memory again.

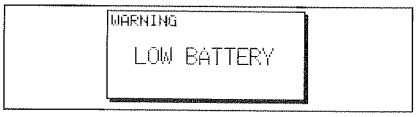
To prevent overload to the car battery

- **The ODR System consume varying amounts of current, depending on units to be combined. When the DIGITAL "Pure Class A" INTEGRATED AMPLIFIER [RS-A1] is combined, the system will consume more current. Observe the following to avoid overloading the battery of the vehicle.**
  - **— Do not use the ODR System while the car engine is OFF or idling for more than 5 minutes. (Switch OFF the system.)**
  - **— Do not use the ODR System under the following conditions, during which the vehicle is consuming a large current. (Switch OFF the system.)**
    Example 1: Two units of RS-A1 are in use + traffic jam + driving at night + rear window defogger is ON
    Example 2: Two units of RS-A1 are in use + traffic jam + driving at night + air-conditioner is used at high level
    Example 3: Two units of RS-A1 are in use + traffic jam + driving at night + accessories (e.g., fog lamp) of high power rating are in use

---

Warning display for flat battery

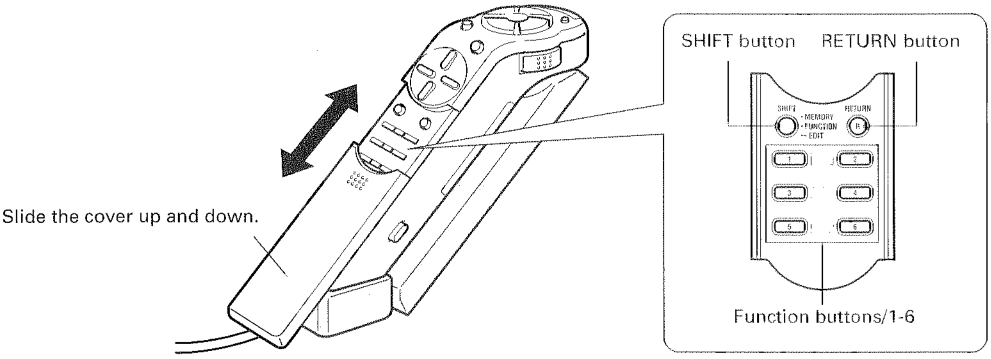
> This unit checks the supply voltage from the battery. If the voltage drops below approximately 11 V for more than 10 seconds, the warning will appear on the display. When this happens, turn OFF the ODR System until the battery is recharged. If the warning still remain displayed, check the battery. (Pressing the operating buttons will restore the previous display.)



Opening and closing the SYSTEM COMMUNICATOR cover

Opening and closing the cover

When the SYSTEM COMMUNICATOR is installed and connected in the base, opening the cover enables the SHIFT, RETURN and Function buttons inside the unit.


Slide the cover up and down.
SHIFT button
RETURN button
SHIFT
• MEMORY
• FUNCTION
-- EDIT
RETURN
1
2
3
4
5
6
Function buttons/1-6

Menu displays with cover open and closed

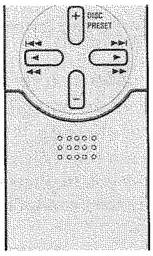
In this system, the available functions and the menu display vary depending on the condition of the SYSTEM COMMUNICATOR in use.

SYSTEM COMMUNICATOR		Menu displayed
Cover closed		Closed state
Cover open	Remote control	Closed state
	Connected	Open state

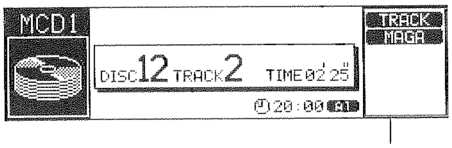
❖ When the cover is closed

The menu display is closed.

Menu display in closed state


DISC
PRESET
+
−

Example: Multi-CD operation screen

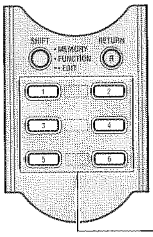

MCD1
DISC12 TRACK2 TIME02'25"
20:00
TRACK
MAGA

Menu display in closed state: Current mode and functions which are ON are displayed.

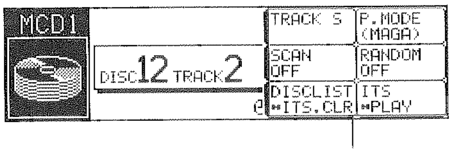
❖ When the cover is open (SYSTEM COMMUNICATOR connected)

Opening the cover with the SYSTEM COMMUNICATOR installed and connected in the base makes the menu display to the open state.

Menu display in open state


SHIFT
•MEMORY
•FUNCTION
••EDIT
RETURN
1
2
3
4
5
6

Example: Multi-CD operation screen


MCD1
DISC12 TRACK2
TRACK S
P.MODE (MAGA)
SCAN OFF
RANDOM OFF
DISCLIST ••ITS.CLR
ITS ••PLAY

Menu display in open state: Using Function buttons/1-6, operable functions are displayed.

Positions of menu items on the display correspond to the positions of Function buttons/1-6.

When the cover is opened while using the SYSTEM COMMUNICATOR as the remote control

> If the cover is opened when the SYSTEM COMMUNICATOR is removed from the base (used as the remote control), buttons located inside the cover cannot be used. The menu display remains in the closed state (see page 8).

When the cover is closed in the middle of operation

> Closing the cover during operation releases the previous operation and returns the menu display to the closed mode. When the SYSTEM COMMUNICATOR is disconnected during operation, the menu display also returns to the closed mode.

Using the SYSTEM COMMUNICATOR as the remote control

The SYSTEM COMMUNICATOR can be removed from the base and used as the remote control.
When the SYSTEM COMMUNICATOR is used as a remote control unit, buttons located behind the cover do not function, even when the cover is opened. Use the SYSTEM COMMUNICATOR with the cover closed.

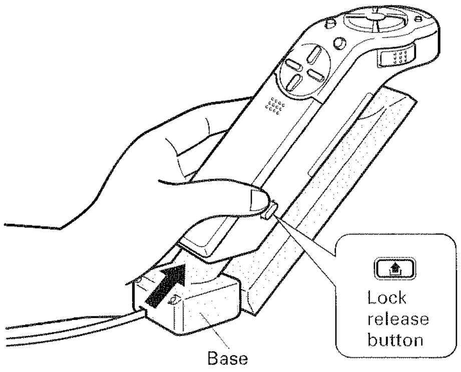
> The functions available with buttons behind the cover require complex operations, including switching of modes. This, in turn, requires you to observe the display very carefully. In order to prevent traffic accidents, these operations cannot be conducted by remote control of which operation tends to become unstable.

> In order to use buttons inside the cover, connect the SYSTEM COMMUNICATOR by placing it in the base.

Removing and replacing the SYSTEM COMMUNICATOR

While holding down the lock release button located on the side of the SYSTEM COMMUNICATOR, slide the SYSTEM COMMUNICATOR up in the direction of the arrow and remove it from the base.

> To return the SYSTEM COMMUNICATOR to the base, push it down until it clicks into place.



CAUTION

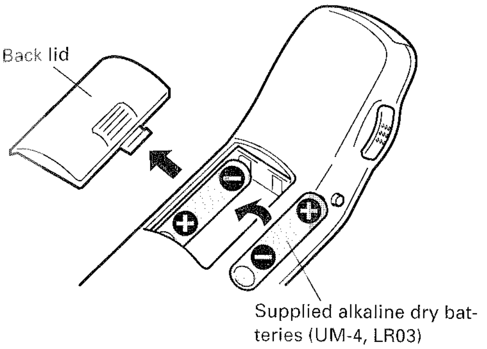
Do not leave the SYSTEM COMMUNICATOR in wireless state for a long time

- **A communicator left on the seat may fall to the car floor upon stopping or turning a curve and may even get under the brake pedal, which can result in severe accidents. Always install the SYSTEM COMMUNICATOR onto the base when not using it.**

Protect the SYSTEM COMMUNICATOR from high temperature

- **Do not leave this unit at a place of direct sunshine or at a hot place for a long time; otherwise heat may cause the unit to deform, change in color, or become faulty.**

Setting batteries



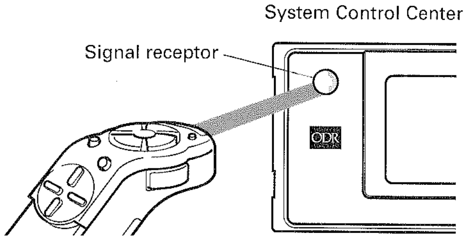
> The use of UM-4 alkaline dry batteries (LR03) for the SYSTEM COMMUNICATOR is recommended.

To prevent battery leakage or rupture:

- **Observe the correct polarity (⊕ and ⊖) when installing batteries.**
- **Do not mix new and old batteries.**
- **Do not use different types of batteries together. Some batteries, although of the same shape, may produce different voltages.**
- **Remove batteries when not using the SYSTEM COMMUNICATOR as the remote control for a long time.**
- **In case of battery leakage, clean the inside of the battery compartment and install new batteries.**

Operating the SYSTEM COMMUNICATOR as the remote control

- The SYSTEM COMMUNICATOR may not work when pointed to your feet or the seat, because the signals may not reach the signal receptor of the System Control Center. When operating the SYSTEM COMMUNICATOR, be sure to point it to the System Control Center.



- The remote control unit uses infrared rays. Therefore, if direct sunlight falls on the signal receptor of the System Control Center, the SYSTEM COMMUNICATOR may not work. If this happens, shield the receptor from the sunlight.
- When it has become necessary to bring the SYSTEM COMMUNICATOR closer to the System Control Center for operation, it is time to replace batteries.

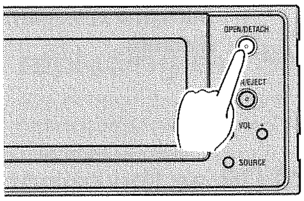
Front panel of the main unit

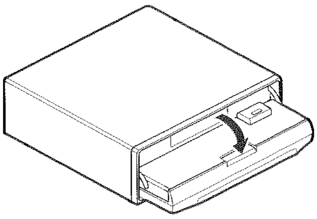
Using open-and-close display

In order to provide a larger, more legible display, the main unit is organized so that the display can be opened and closed. Opening the display, the cassette port is located there.

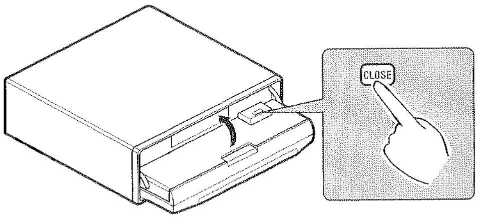
❖ Opening and closing the display

Pressing the OPEN/DETACH button opens the display.





Pressing the CLOSE button closes the display.



Caution on opening and closing the display

- **Do not place objects on the display or forcibly press down when it is open, as this may cause malfunction.**
- **Be careful not to trap your fingers or other objects into the display during the opening and closing operations.**

When the ignition switch is turned OFF

> The display can be opened and closed for 30 seconds after turning the ignition switch OFF. Opening or closing the display during this while will extend the time by another 30 seconds.

Using the removable front panel

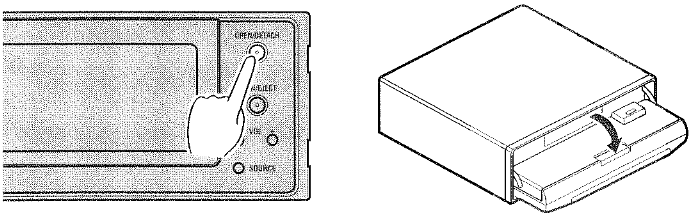
The front panel of this unit can be removed as a theft deterrent. The front panel can be easily removed and taken with when leaving the vehicle.
If you forget to remove the front panel after switching OFF the ignition, a warning beep will sound to attract your attention after about 4 seconds.

> You can enable or disable this warning beep according to your preference (see page 19).

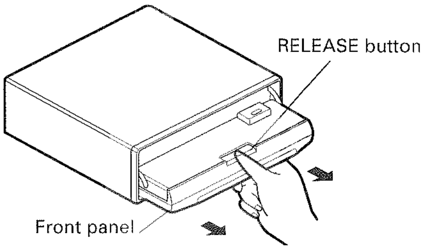
❖ Detaching the front panel

1. Press the OPEN/DETACH button to open the display.

> When the ignition switch is turned OFF, press the OPEN/DETACH button within 30 seconds. If the OPEN/DETACH button is pressed more than 30 seconds after switching off the ignition, the display will not open.



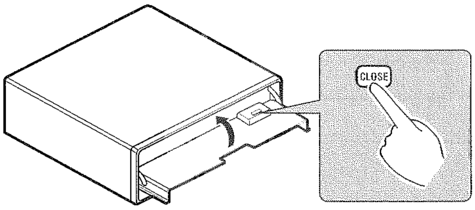
2. While pressing down the RELEASE button, pull the front panel off towards you.



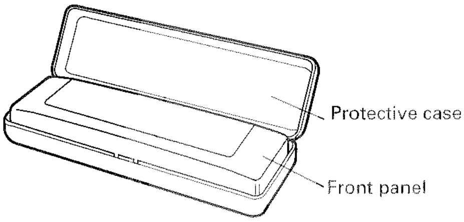
3. Close the inner lid while pressing the CLOSE button.

To prevent dust or foreign objects from entering the cassette chamber, be sure to close the inner lid.

> Press the CLOSE button within 30 seconds of pressing the OPEN/DETACH button as described in step 1. After passing 30 seconds, the inner lid cannot be closed by pressing the CLOSE button. In this case, close the inner lid manually.

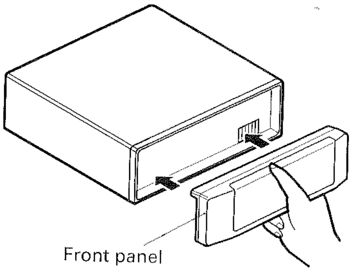


4. Keep the front panel in the protective case.



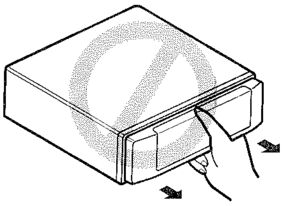
❖ Replacing the front panel

1. **Check that the inner lid is closed.**
   If the inner lid is open, close it.
2. **Press the front panel to the main unit.**
   Do not attempt to operate buttons or display during this operation.

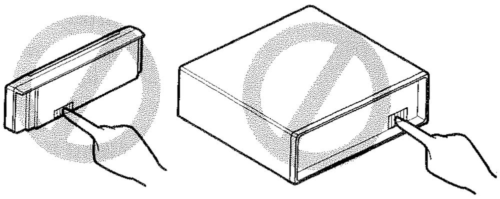


Handling of the front panel

- **Do not use force to remove the front panel.**



- **Do not hold the display and buttons tightly when removing and affixing the front panel.**
- **Avoid jarring the front panel by dropping or bumping.**
- **Do not put the front panel in places where it may get hot or exposed to direct sunlight.**
- **Do not dismantle it.**
- **Do not apply volatile materials such as benzine or thinner to the display. They may damage the surface of the display.**
- **Do not touch terminals on the front panel or on the main unit. Doing so may cause connection failures. If they are stained, wipe them with a clean dry cloth.**



If the front panel is not installed correctly in place

> If the front panel is not properly installed, operating buttons may not function. In this case, push the front panel gently and set it into position.

Setting up the environment for use

Choose the way to use the main unit, including adjustment of contrast on the display and selection of negative/positive display. Some functions are not available unless their setting is selected. Set up the environment to suit the system to be used.

Switching to the environment setup mode M1

Use the environment setup mode to choose all environment settings. First, switch to the environment setup mode. This can be done in the following two methods.

Operating with the main unit

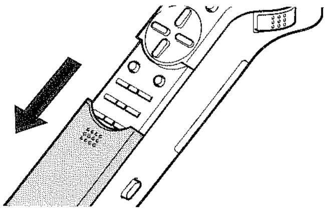
The environment setup mode can be attained regardless of the ON/OFF of the power.

Operating with the SYSTEM COMMUNICATOR

You can only switch to the environment setup mode when the system is OFF.

❖ Operating with the main unit

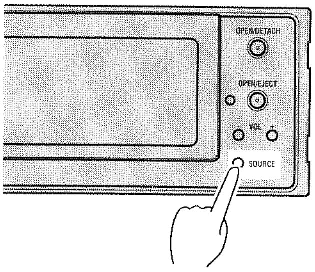
1. **Open the cover of the SYSTEM COMMUNICATOR.**



> The buttons inside the cover cannot be operated with the SYSTEM COMMUNICATOR is removed from the base. Set the SYSTEM COMMUNICATOR in the base before opening the cover and make it connected (see page 8).

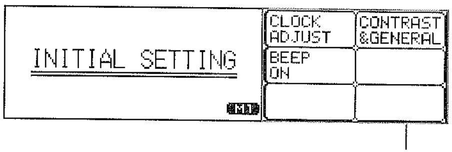
2. **Hold down the SOURCE button for at least two seconds to switch to the environment setup mode.**

The display switches to M1: environment setup mode/initial screen.



For at least 2 seconds.

M1: Environment setup mode/initial screen



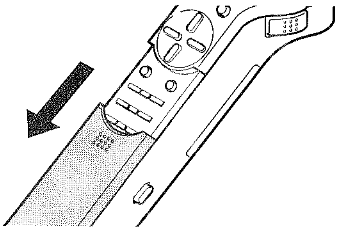
Function buttons display

❖ Operating with the SYSTEM COMMUNICATOR

1. Turn OFF the system.

> Unless the system is turned OFF, it is not possible to switch to the environment setup mode using the SYSTEM COMMUNICATOR. (See page 26 for how to turn OFF the system.)

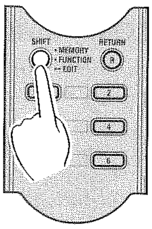
2. Open the cover of the SYSTEM COMMUNICATOR.



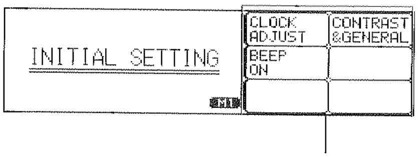
> The buttons inside the cover cannot be operated with the SYSTEM COMMUNICATOR is removed from the base. Set the SYSTEM COMMUNICATOR in the base before opening the cover and make it connected (see page 8).

3. Press the SHIFT button to switch to the environment setup mode.

Pressing the SHIFT button switches to M1: environment setup mode/initial screen.



M1: Environment setup mode/initial screen



Function buttons display

❖ Operations performed in the environment setup mode

In the environment setup mode, the following settings and operations can be done:

Setting of clock (page 15)

Setting of contrast/general environment (page 18)

Setting of confirmation sound (page 22)

Release of the environment setup mode (page 22)

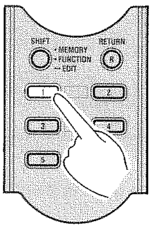
Setting the clock

M1

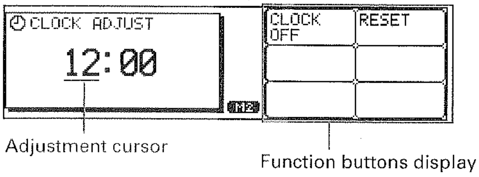
❖ Switching to the clock adjustment screen —— M2

Press the Function button/1 on M1: initial screen.

This switches to M2: clock adjustment screen and enables clock setting.


SHIFT
RETURN
• MEMORY
• FUNCTION
• EDIT
1
2
3
4
5

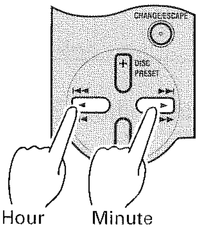
M2: Clock adjustment screen

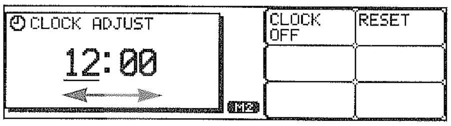

CLOCK ADJUST
12:00
M2
CLOCK OFF
RESET
Adjustment cursor
Function buttons display

M2

❖ Setting the clock for the correct time

1. **Press ◄ ► buttons and move the cursor to the section (hour, minute) to be adjusted.**

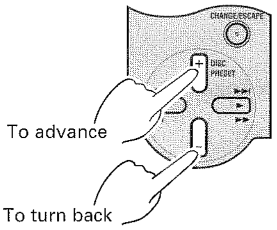

CHANGE/ESCAPE
DISC
PRESET
Hour
Minute


CLOCK ADJUST
12:00
M2
CLOCK OFF
RESET

2. **Press +/– buttons to set the clock.**

   Holding these buttons down extends the operations continuously.

   > Seconds are not displayed. However, when releasing the buttons after setting the time, the clock starts from zero second.


CHANGE/ESCAPE
DISC
PRESET
To advance
To turn back

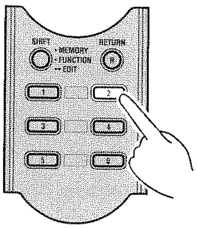
M2

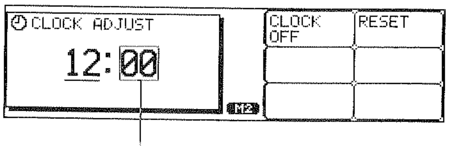
❖ Setting the clock by time signal

Press the Function button/2 to reset the minute display.

As the clock starts from zero seconds when pressing the button, the clock can be set using the time signal (radio, telephone, etc.).

> From 00 to 29 minutes, the hour remains the same, making the minute display "00". From 30 to 59 minutes, it is rounded up to the next hour.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6


CLOCK ADJUST
12:00
CLOCK OFF
RESET
M2

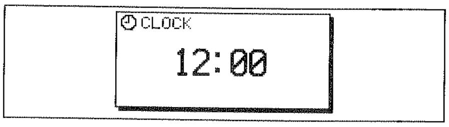
The minute display is reset to 00.

M2

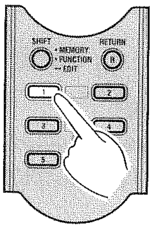
❖ ON/OFF of the clock display

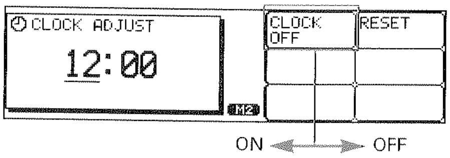
Even when the system is turned OFF, it is possible to display the clock.

Clock display with the system OFF



Pressing the Function button/1 switches the clock display ON and OFF.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5


CLOCK ADJUST
12:00
CLOCK OFF
RESET
M2
ON
OFF

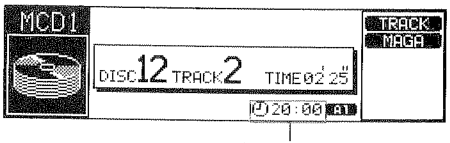
To avoid overload to the battery

- **Avoid using the clock display for many hours when the car engine is switched off.**

When the system is ON

> When the display shows the operation screen of each source, the clock time is always displayed on the screen.

Example: Multi-CD operation screen


MCD1
TRACK
MAGA
DISC 12 TRACK 2 TIME 02'25"
20:00
A1

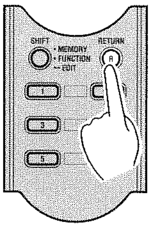
Clock display

M2

❖ Returns to the initial screen

Press the RETURN button.

The display returns to M1: initial screen.

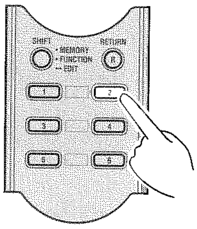

SHIFT
MEMORY
FUNCTION
EDIT
RETURN
R
1
3
5

Setting up the display contrast and the general environment

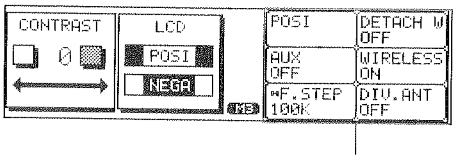
M1 ❖ Switching to the contrast/general setting screen — M3

When the display shows M1: initial screen, press the Function button/2.

Pressing the Function button/2 switches to M3: contrast/general setting screen, allowing the adjustment of contrast and setting of general environment.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6

M3: Contrast/General setting screen


CONTRAST
0
LCD
POSI
NEGA
M3
POSI
DETACH W
OFF
AUX
OFF
WIRELESS
ON
F.STEP
100K
DIV.ANT
OFF

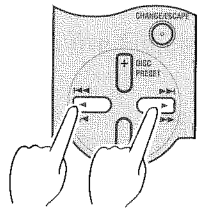
Function buttons display

M3 ❖ Adjusting the display contrast

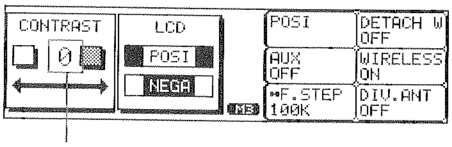
If it is hard to read the display, adjust the contrast for better legibility.

Press ◀ ▶ buttons to adjust the display contrast.

Holding down these buttons will continue the operation.


CHANGE/ESCAPE
DISC
PRESET

Lower contrast Higher contrast

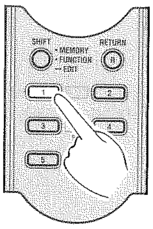

CONTRAST
0
LCD
POSI
NEGA
M3
POSI
DETACH W
OFF
AUX
OFF
WIRELESS
ON
F.STEP
100K
DIV.ANT
OFF

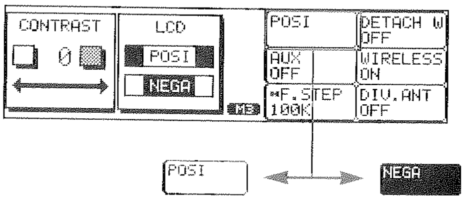
-7 — +7
Lower (bright) Higher (dim)

M3 ❖ Selecting the positive/negative display

It is possible to choose between positive display (dark characters on a bright background) and negative display (bright characters on a dark background). The initial setup is the positive display.

Pressing the Function button/1 switches the display between positive and negative.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5

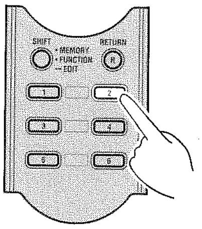

CONTRAST
0
LCD
POSI
NEGA
M3
POSI
DETACH W
OFF
AUX
OFF
WIRELESS
ON
F.STEP
100K
DIV.ANT
OFF
POSI
NEGA

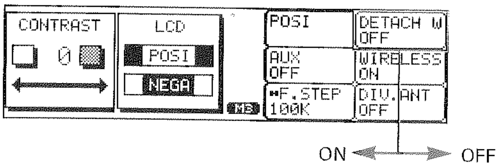
M3

❖ Setting up the warning beep tone of the removable front panel

The ON/OFF of the warning beep, for preventing the front panel left unremoved, can be selected as desired. The initial setting is ON.

Pressing the Function button/2 switches ON and OFF the warning beep.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6

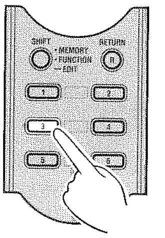

CONTRAST
0
LCD
POSI
NEGA
M3
POSI
AUX
OFF
F.STEP
100K
DETACH W
OFF
WIRELESS
ON
DIV.ANT
OFF
ON
OFF

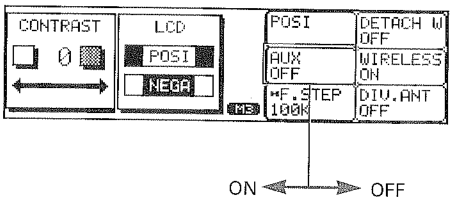
M3

❖ Setting up AUX (external input)

Turn ON the AUX to connect external equipment (video, DAT with RCA output, etc. which cannot be controlled by the main unit) to the IP-BUS input terminal (blue) of the main unit. (The initial AUX setting is OFF.) If the AUX is not ON, the main unit does not switch to the AUX source. (See page 26 for instructions on the source switching.)

The Function button/3 switches the AUX ON and OFF.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6


CONTRAST
0
LCD
POSI
NEGA
M3
POSI
AUX
OFF
F.STEP
100K
DETACH W
OFF
WIRELESS
ON
DIV.ANT
OFF
ON
OFF

If there is no external equipment

> If there is no external equipment connected, leave the AUX OFF.

Detailed instructions for connecting to the IP-BUS input terminal

> See page 127 for the correct connection.

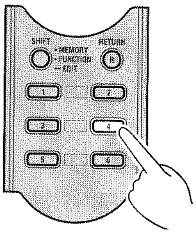
M3

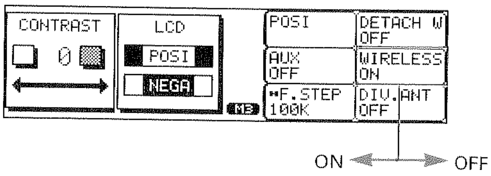
❖ Preventing unintended operation of the main unit by other remote control units

Remote control units for all PIONEER products use the same signal frequency. If one of these products is connected to the AUX (external input) and the remote control unit is used to operate it, you may inadvertently send commands to the main unit.

If this happens, switch OFF the remote control setting. The main unit will then no longer be disturbed by signals from other remote control units. (The initial setting is ON.)

Pressing the Function button/4 switches the remote control setting ON and OFF.




CONTRAST 0
LCD POSI NEGA
M3
POSI
AUX OFF
•F.STEP 100K
DETACH W OFF
WIRELESS ON
DIV.ANT OFF

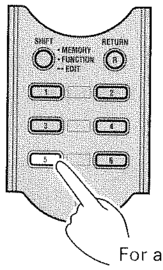
ON ⟷ OFF

M3

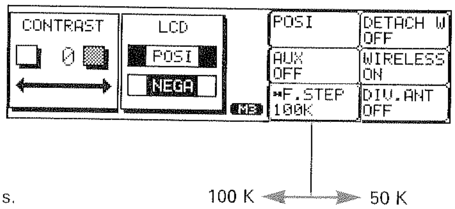
❖ Setting the FM tuning step while in AF or TA mode

The tuning step of the FM seek tuning is normally conducted in increments of 100 kHz while in AF or TA mode. However, the frequency step can be switched from 100 kHz to 50 kHz. (Refer to page 55 for AF and TA modes.)

1. **Turn OFF the system.**
   (See page 26.)
2. **Switch to environment setup mode.**
   (See page 13.)
   It is not possible to change the tuning steps when the system is on, even if the unit is switched to environment setup mode, so be sure the system is OFF before switching to environment setup mode.
3. **Holding down Function button/5 for at least 2 seconds switches the tuning step to 50 kHz.**
   Holding down the button again for at least 2 seconds returns to 100 kHz step.



For at least 2 seconds.


CONTRAST 0
LCD POSI NEGA
M3
POSI
AUX OFF
•F.STEP 100K
DETACH W OFF
WIRELESS ON
DIV.ANT OFF

100 K ⟷ 50 K

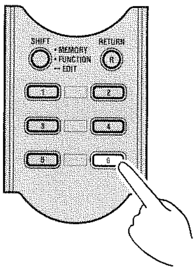
After switching the remote control setting to OFF

> The SYSTEM COMMUNICATOR can no longer be used as the remote control. Place the SYSTEM COMMUNICATOR in the base and make it connected.

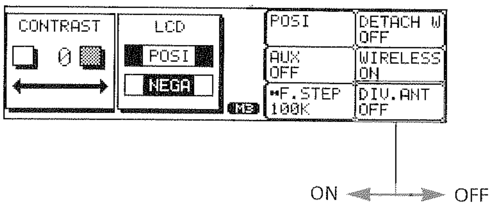
M3 ❖ Setting the FM diversity system

Turn ON the FM diversity system for use, and switch it OFF when not in use. (The initial setting is OFF.)

Pressing the Function button/6 switches the FM diversity system ON and OFF.



SHIFT
• MEMORY
• FUNCTION
•• EDIT
RETURN
R
1
2
3
4
5
6

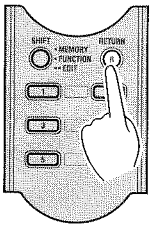


CONTRAST
0
LCD
POSI
NEGA
M3
POSI
DETACH W
OFF
AUX
OFF
WIRELESS
ON
F.STEP
100K
DIV.ANT
OFF
ON
OFF

M3 ❖ Returning to the initial screen

Press the RETURN button.

The display returns to M1: initial screen.



SHIFT
• MEMORY
• FUNCTION
•• EDIT
RETURN
R
1
3
5

What is the FM diversity system?

> The FM diversity system receives FM broadcasts using two antennas. When reception through the main antenna is poor, the system automatically switches to the sub-antenna.

When the FM diversity system is not used

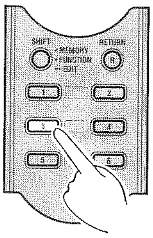
> Be sure to use the tuner of the main unit with the FM diversity system OFF. If the tuner is used with the FM diversity system ON, it may adversely affects sensitivity or increase noise.

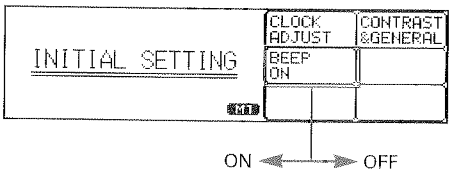
M1 Turning the confirmation sound ON/OFF

The beep that sounds when buttons are pressed can be enabled or disabled (ON/OFF). The initial setting is ON.

When the display shows M1: initial screen, press the Function button/3.

Pressing the button switches the confirmation sound ON and OFF.

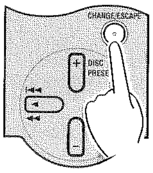

SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6


INITIAL SETTING
CLOCK ADJUST
CONTRAST &GENERAL
BEEP ON
M1
ON
OFF

M1 – M3 Releasing the environment setup mode

Press the CHANGE/ESCAPE button to release the environment setup mode.

The display will return to the previous mode.


CHANGE/ESCAPE
DISC

Other methods to release the environment setup mode

> Closing the cover of the SYSTEM COMMUNICATOR releases environment setup mode. Removing the SYSTEM COMMUNICATOR from the base to use it as the remote control also releases the environment setup mode.

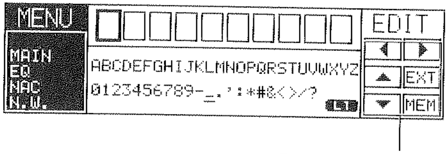
> Switching to other sources releases the environment setup mode (see page 26).

Entering characters in the edit mode

Switch to the edit mode when inputting characters to enter titles of CDs (see page 39) or the name of the person who sets up the audio adjustment (see page 124). This information will be stored in the memory. This section explains how to input characters in the edit mode.

> For a disc title, up to 10 characters can be entered.
> For the name of the person who sets up the audio environment, up to 20 characters can be entered.
> See each page for how to switch to edit mode.

L1: Character input screen


MENU
MAIN
EQ
NAC
N.W.
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789-_.';:*#&<>/?
L1
EDIT
◀ ▶
▲ EXT
▼ MEM

Function buttons display

⚠ CAUTION

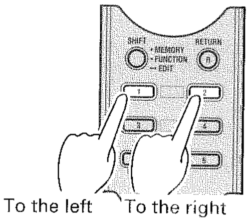
To avoid accidents

- **Inputting characters requires the user to look at the screen for a long time. Therefore, to avoid accidents, do not input characters while driving.**

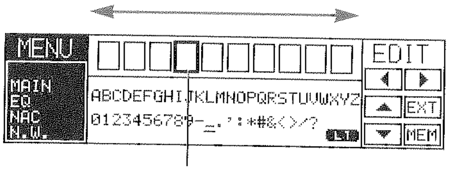
L1 ❖ Entering characters

1. Press Function buttons/1, 2, 3 and 5 to select the input position.

Holding down any of these buttons prolongs the operation continuously.


SHIFT
RETURN
•MEMORY
•FUNCTION
→EDIT
1
2
3
4
5

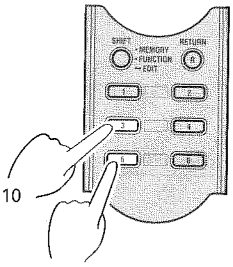
To the left To the right


MENU
MAIN
EQ
NAC
N.W.
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789-_.';:*#&<>/?
L1
EDIT
◀ ▶
▲ EXT
▼ MEM

The selected input position is marked with a bolder square.

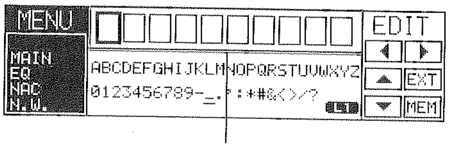
Entering the name of the person who sets up the audio adjustment (this operation cannot be carried out for inputting disc titles)

Because the space is limited on the display, characters are entered in two stages, the first 10 characters, followed by the remaining 10 characters.


SHIFT
RETURN
•MEMORY
•FUNCTION
→EDIT
1
2
3
4
5
6

For the first 10 characters

For 11—20 characters


MENU
MAIN
EQ
NAC
N.W.
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789-_.';:*#&<>/?
L1
EDIT
◀ ▶
▲ EXT
▼ MEM

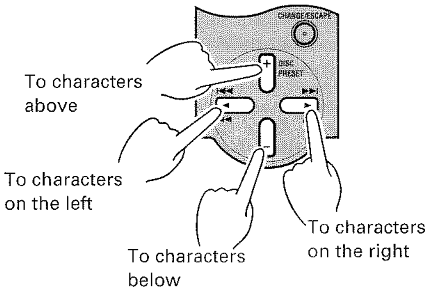
The display switches to the next screen.

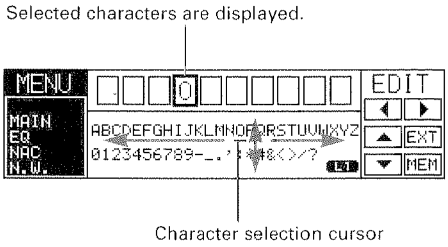
Continued overleaf.

2. **Press ◀ ▶ buttons and +/– buttons to select the characters to be input.**

Holding down these buttons prolongs the operation continuously.

> When entering a space, select the space symbol "_" located between the "–" and ".".

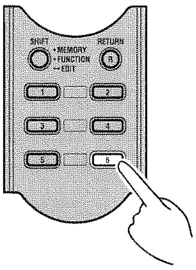

To characters above
To characters on the left
To characters below
To characters on the right
CHANGE/ESCAPE
DISC
PRESET


Selected characters are displayed.
MENU
MAIN
EQ
NAC
N.W.
O
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789-_.'*#&<>/?
EDIT
EXT
MEM
Character selection cursor

3. **Repeat steps 1 and 2 to enter all characters.**

4. **Press the Function button/6 to store information in the memory.**

Characters are stored, and then the display returns to the previous mode.

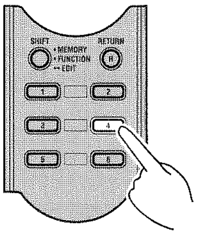

SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6

L1

❖ To release the edit mode

Press the Function button/4.

The edit mode is released, and the display returns to the previous mode. (Input characters are not stored in memory.)


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6

If wrong characters are entered or change of character is required

> Entering new characters using steps 1 and 2 will write new characters over the old ones.

Other methods to release the edit mode

> Closing the cover of the SYSTEM COMMUNICATOR quits the edit mode. The system also releases the edit mode when the SYSTEM COMMUNICATOR is removed from the base.

> If any operation other than character entry is performed, the edit mode will be released.

Operations

— Listening to the source —

First, perform common operations such as adjusting the volume and switching to the desired source (radio, tape deck etc.).
Having made the desired adjustments, listen to each sound source, and experiment with each source's convenient functions.

CONTENTS

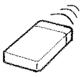
- **Turning ON the power 26**
  Switching the source 26
- **Adjusting the volume 27**
  Adjusting the volume 27
  Temporarily lowering the volume (attenuator) 28
  Regarding the cellular telephone muting 28
- **Using the multi-CD player 29**
  Turning the multi-CD player ON/OFF 29
  Selecting a multi-CD player 30
  Selecting discs (disc number search) 30
  Selecting music (track search) and fast forward/reverse 32
  Selecting play mode (repeat play) 33
  Conducting scan play 34
  Random play 35
  Playing only selected tracks (ITS play) 36
  Inputting disc titles 39
- **Using the tape deck 41**
  Before listening to a cassette 41
  Tape playback ON/OFF 42
  Switching between sides A and B (Tape direction) 44
  Using fast forward, rewind and music search 44
  Dolby NR system 45
  Blank skip 45
  Repeat playback 46
  Listening to the radio during fast forward/ rewind (radio intercept) 46
- **Using the tuner 47**
  Radio ON/OFF 47
  Selecting the band 47
  Selecting a radio station 48
  Adjusting reception sensitivity (local seek tuning) 49
  Storing radio station frequencies in memory 50
  Recalling a stored radio station in memory 52
  Switching to monaural reception mode 54
  Using the RDS function 55
- **Traffic information reception 58**
  TP and EON-TP functions 58
  TA reception while listening to other sources 60
  Tuning Functions on each RDS modes 60

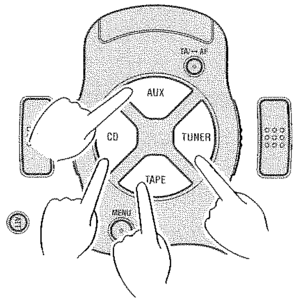
Turning ON the power

Switching the source

The following operations will allow the source to be switched:

Press the buttons shown to switch to the source indicated.





CD: Single-CD player → Multi-CD player → Power OFF

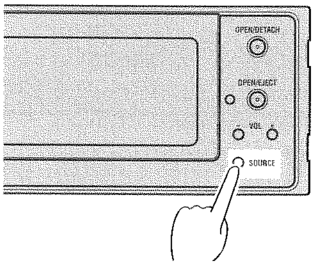
Tape: Tape deck → Power OFF

Tuner: Tuner (FM, MW/LW) → Power OFF

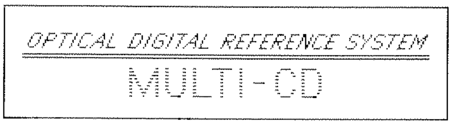
AUX: AUX (external input) → Power OFF

The source can also be switched on the main unit.

Pressing the SOURCE button will switch as follows:



Example: Multi-CD player title screen



After a few seconds the screen changes to the operations screen.

→ Single-CD player → Multi-CD player → Tape deck → Tuner (FM, MW/LW) → AUX (external input) → Power OFF →

Single CD player

- > In this manual, a CD player (one disc only) which can be directly controlled by [RS-K1] is called a single-CD. (This refers to a SYSTEM CONTROL TUNER/CD [RS-D2].
- > See the single-CD owner's manual for details of operating a single-CD.

The unit will not switch to a requested source in the following cases:

- > The source is not installed.
- > There is no CD in the single-CD player.
- > There is no magazine in the multi-CD player.
- > There is no cassette tape in this unit.
- > The AUX (external input) setting is OFF. (See page 19.)

When switching to the source from power OFF

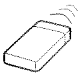
- > The ODR System checks which components are connected after the power is turned ON. For this reason, there is a delay of a few seconds before sound is heard after the power has been switched ON. (The same applies when the ignition is turned from OFF to ON.)

AUX (external input)

- > When external equipment is connected, sound from this equipment is output when the source is switched to AUX. (Operations are then performed using the external equipment.)
- > When the source is switched to AUX and the volume of external equipment (sound input to the main unit) is excessive, "WARNING" is shown on the display. Reduce the volume of external equipment until "WARNING" disappears.

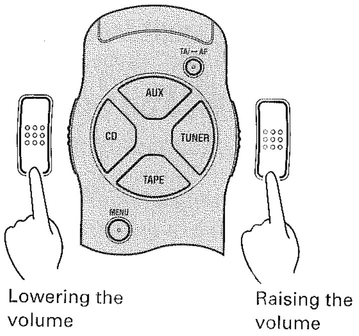
Adjusting the volume

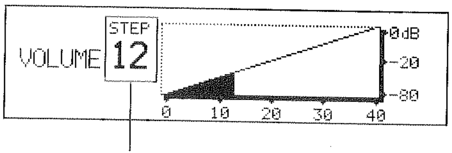
Adjusting the volume



Press the volume button.

Hold the button down to adjust the volume continuously.


TA/—AF
AUX
CD
TUNER
TAPE
MENU
Lowering the volume
Raising the volume

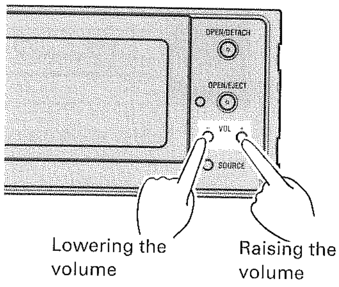

VOLUME
STEP
12
0dB
-20
-80
0
10
20
30
40

Minimum: 00 — Maximum: 40
The screen will revert to the previous screen about 3 seconds after releasing the button.

The volume can also be adjusted on the main unit.

Press the VOL button.

Hold the button down to adjust the volume continuously.


OPEN/DETACH
OPEN/EJECT
VOL
SOURCE
Lowering the volume
Raising the volume

CAUTION

Keep the volume to a moderate level

- **Keep the volume at a level which allows outside sounds to be heard while driving. Driving is dangerous if the driver cannot hear sounds outside the vehicle.**

To avoid overload to the battery

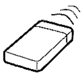
- **Do not use the unit at high volume for a long period when the car engine is off or idling.**

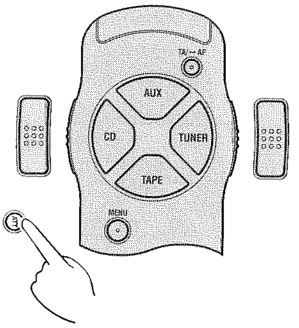
Temporarily lowering the volume (attenuator)

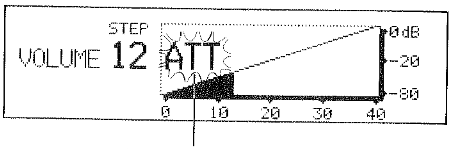
This is convenient when, for example, conversing in the vehicle or paying a freeway toll.

Press the ATT button to reduce the volume to 1/10 its present level.

Press the button again to restore the volume to its previous level.



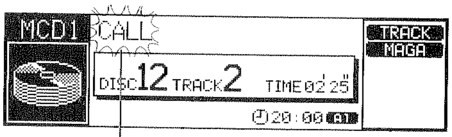

TA/↔AF
AUX
CD
TUNER
TAPE
MENU


STEP
VOLUME 12 ATT
0dB
-20
-80
0
10
20
30
40

Indicator flashes.

Regarding the cellular telephone muting

When making or receiving a call on the cellular telephone, the cellular telephone mute function will come ON, reducing the volume. The volume returns to its previous level when the phone is hung up.


MCD1
CALL
TRACK
MAGA
DISC12 TRACK2 TIME 02 25
20:00
A1

"CALL" flashes while the cellular telephone mute is ON.

Using the multi-CD player

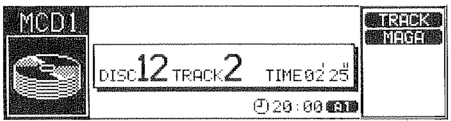
If the multi-CD player [RS-M1] is connected, it can be controlled through the unit. (Up to 4 multi-CD players can be connected.)

Turning the multi-CD player ON/OFF A1

1. **Check that there are magazines in the multi-CD player.**
   (Refer to the multi-CD player owner's manual.)
2. **Press the CD button to switch the source to multi-CD.**
   (See page 26.)

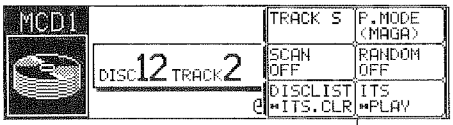
   After the title screen, the display switches to A1: multi-CD operation screen. Opening and closing the cover of the SYSTEM COMMUNICATOR switches between the open and closed states of the menu display.

A1: Multi-CD operation screen (closed state)


MCD1
TRACK
MAGA
DISC12 TRACK2 TIME02'25"
20:00 A1

Mode display

A1: Multi-CD operation screen (open state)


MCD1
DISC12 TRACK2
TRACK S
F.MODE <MAGA>
SCAN OFF
RANDOM OFF
DISCLIST ▸ITS.CLR
ITS ▸PLAY

Function buttons display

When a multi-CD player is performing a self-check

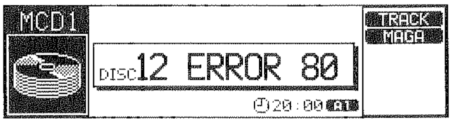
> When the power is turned ON or when the discs to be played are replaced, the multi-CD player may carry out a self-check (this includes confirming that discs are present, reading disc information and so on). During this operation, the display shows "READY".

If the magazine is removed while the multi-CD is playing

> The system does not turn OFF, but "NO MAGAZINE" is displayed. To avoid overloading the battery, turn the system OFF when the CD is not playing. (Replacing the magazine automatically recommences CD play.)

Error display

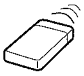
> When the multi-CD player is not working correctly, an error message appears on the display. Identify the error from the multi-CD player owner's manual.

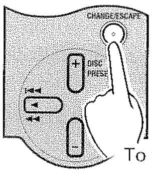

MCD1
TRACK
MAGA
DISC12 ERROR 80
20:00 A1

A1 Selecting a multi-CD player

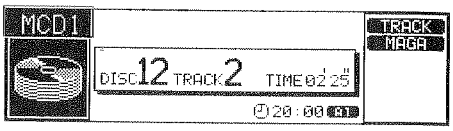
— when two or more multi-CD players are connected —

Press the CHANGE/ESCAPE button to switch to the next multi-CD player.




CHANGE/ESCAPE
DISC PRESET

To the next multi-CD player


MCD1
TRACK
MAGA
DISC 12 TRACK 2 TIME 02'25"
20:00
A1

Selecting discs (disc number search)

The following two methods can be used for disc number search:

Scrolling in order/reverse order

Select a disc number by scrolling forwards or backwards.

> It is possible to select the desired discs while the disc list screen is displayed by scrolling through the numbers either forwards or backwards (see page 40 for details of the disc list screen).

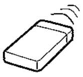
> This is convenient when function buttons cannot be used while the SYSTEM COMMUNICATOR is in the remote control state.

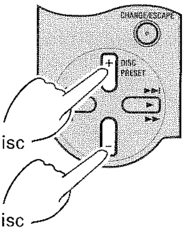
Input the desired disc numbers directly

This operation can be carried out when the cover of the SYSTEM COMMUNICATOR is open and the menu displays open state. The desired discs can be retrieved directly.

A1 ❖ Selecting discs by scrolling in order/reverse order

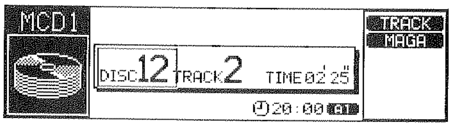
Pressing the +/– buttons, scroll through the disc numbers in order/reverse order.




CHANGE/ESCAPE
DISC PRESET

To the next disc

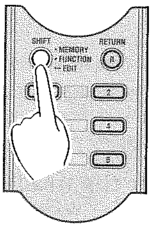
To the previous disc

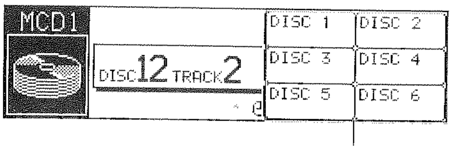

MCD1
TRACK
MAGA
DISC 12 TRACK 2 TIME 02'25"
20:00
A1

A1

❖ Specify the disc numbers directly

1. Press the SHIFT button to switch to the disc number display.

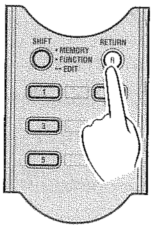

SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT

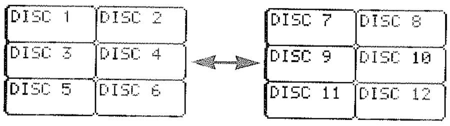

MCD1
DISC 12 TRACK 2
DISC 1
DISC 2
DISC 3
DISC 4
DISC 5
DISC 6

Disc number display

2. Press the RETURN button to switch the disc numbers.

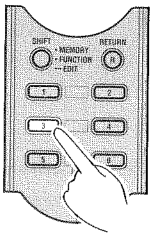
Press the button to switch between the screen indicating discs 1-6 and that indicating discs 7-12.

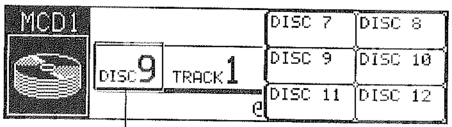

SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT


DISC 1
DISC 2
DISC 3
DISC 4
DISC 5
DISC 6
DISC 7
DISC 8
DISC 9
DISC 10
DISC 11
DISC 12

3. Select discs using Function buttons/1-6.

Example: Selecting disc 9

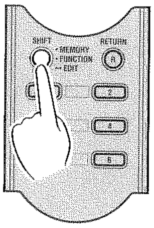

SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT

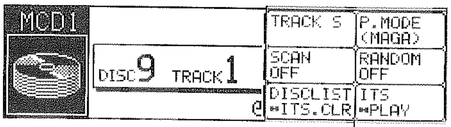

MCD1
DISC 9 TRACK 1
DISC 7
DISC 8
DISC 9
DISC 10
DISC 11
DISC 12

The selected disc is retrieved.

4. Press the SHIFT button to cancel the disc number display.

The screen returns to the Function buttons display.


SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT


MCD1
DISC 9 TRACK 1
TRACK S
P.MODE (MAGA)
SCAN OFF
RANDOM OFF
DISCLIST ↔ITS.CLR
ITS ↔PLAY

Function buttons display

Disc number of a tray in which no disc has been inserted cannot be selected.

A1 Selecting music (track search) and fast forward/reverse

Track search mode

When the unit is in track search mode, music can be selected by its number.

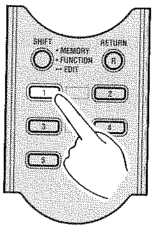
Manual search mode

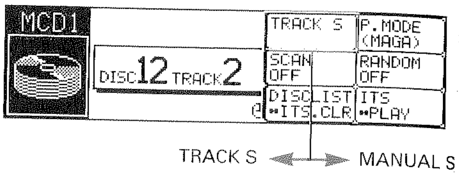
When the unit is in manual search mode, fast forward/reverse may be performed.

> Switching between these two modes can only be conducted when the cover of the SYSTEM COMMUNICATOR is open and the menu displays open state. However, track number search and fast forward/reverse can be conducted with the cover closed.

1. **Press Function button/1 to select the mode.**

Press the button to switch mode.

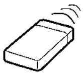

SHIFT
RETURN
MEMORY
FUNCTION
EDIT
1
2
3
4
5

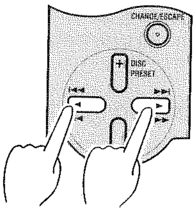

MCD1
DISC12 TRACK2
TRACK S
P.MODE <MAGA>
SCAN OFF
RANDOM OFF
DISC LIST ••ITS.CLR
ITS ••PLAY
TRACK S
MANUAL S

> In the closed state, each mode is displayed.

2. **Press the ◄ ► buttons to operate.**

Holding down these buttons continues the operations.

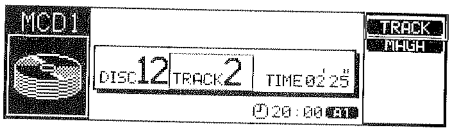



CHANGE/ESCAPE
DISC
PRESET

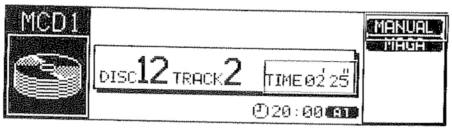
To the previous track
Reverse

To the next track
Fast forward

During track search


MCD1
DISC12 TRACK2
TIME 02'25"
20:00 A1
TRACK
MAGA

During fast forward/reverse

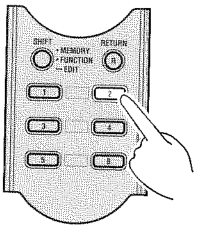

MCD1
DISC12 TRACK2
TIME 02'25"
20:00 A1
MANUAL
MAGA

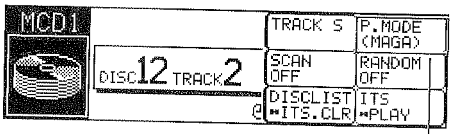
A1 Selecting play mode (repeat play)

Play mode (repeat mode) can be selected in the following instances:

Play mode (repeat mode)	Play contents
One track repeat (REPEAT)	The track being played can be repeated. > Conducting a track search or fast forward/rewind switches to disc repeat mode. > Switching the multi-CD player being played or the disc switchess to magazine repeat mode.
Disc repeat (DISC)	The disc being played can be played repeatedly. > Switching the multi-CD player being played or the disc switches to magazine repeat mode.
Magazine repeat (MAGA)	The magazine in the multi-CD player currently being played can be played repeatedly. After all the discs in the magazine have been played, the system returns to the first disc to repeat the play sequence.
ALL repeat (ALL)	The unit will only switch to this mode if two or more multi-CD players are connected. In this mode multi-CD 1 through multi-CD 4 can be played.

Pressing Function button/2 switches the play mode in the following sequence:


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
R
1
2
3
4
5
6


MCD1
DISC12 TRACK2
TRACK S
P.MODE (MAGA)
SCAN OFF
RANDOM OFF
DISCLIST ↦ITS.CLR
ITS ↦PLAY

REPEAT → DISC → MAGA → ALL

> In the closed state, each mode is displayed.

A1 Conducting scan play

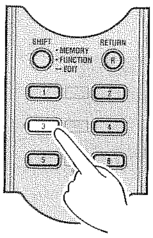
The first 10 seconds of each track are played in turn. This function is convenient for searching for particular music or discs.
Scan play is conducted as follows while in the current play mode (repeat mode):

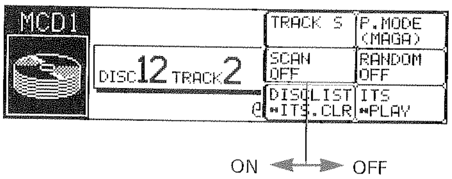
Play mode (repeat mode)	Music targeted for scan play
One track repeat (REPEAT)	↓ (When scan play is conducted, play mode switches to disc repeat mode.)
Disc repeat (DISC)	All the tracks in the disc being played back.
Magazine repeat (MAGA)	The first track on the discs in the magazine is played.
All repeat* (ALL)	The first track on the discs in all the magazines in multi-CD 1 to multi-CD 4 is played.

* When 2 or more multi-CD players are connected.

1. **Switch play mode (repeat mode).**
   (see page 33.)
   Select play mode for the desired scan playback.

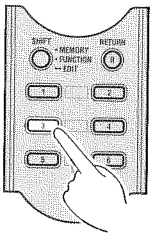
2. **Press Function button/3 to commence scan playback.**
   The first 10 seconds or so of each track are played, one after another.


SHIFT
RETURN
MEMORY
FUNCTION
EDIT
1
2
3
4
5
6


MCD1
DISC 12 TRACK 2
TRACK 5
P.MODE (MAGA)
SCAN OFF
RANDOM OFF
DISCLIST ∗ITS.CLR
ITS ∗PLAY
ON
OFF

> In closed state, "SCAN" is displayed during scan playback.

3. **Press Function button/3 again to cancel scan play, after reaching to the desired track (disc).**
   The track (disc) being played can be played continuously.


SHIFT
RETURN
MEMORY
FUNCTION
EDIT
1
2
3
4
5
6

Scan play is automatically canceled

> When it returns to the track (disc) at which scan play began, scan play is canceled.

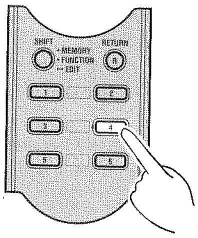
A1 Random play

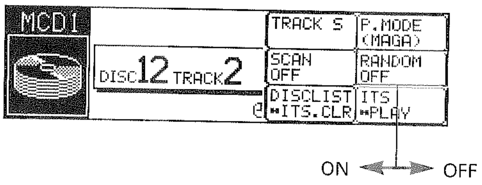
The microprocessor built into the multi-CD player randomly selects tracks from the disc.
Random play is conducted as follows during current play mode (repeat mode).

Play mode (repeat mode)	Tracks targeted for random play
One track repeat (REPEAT)	↓ (When random play is conducted, the play mode switches to disc repeat mode.)
Disc Repeat (DISC)	Every track on the disc is played.
Magazine repeat (MAGA)	All the tracks on all the discs in the magazine are played.
All repeat* (ALL)	All the tracks on all the discs in all the magazines in multi-CD 1 to multi-CD 4 are played.

* When 2 or more multi-CD players are connected.

1. **Switch play mode (repeat mode).**
   (see page 33.)
   Select play mode for the desired random play to be performed.
2. **Press Function button/4 to begin random play.**
   Press the button again to cancel.


SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT
1
2
3
4
5
6


MCD1
DISC12 TRACK2
TRACK S
P.MODE
(MAGA)
SCAN
OFF
RANDOM
OFF
DISCLIST
••ITS.CLR
ITS
••PLAY
ON
OFF

> In closed state, "RANDOM" is displayed during random play.

Playing only selected tracks (ITS play)

ITS (Instant Track Selection) play is a function that stores selected tracks temporarily in memory, and plays only these.
Enjoy CD listening by storing in memory only the tracks desired.

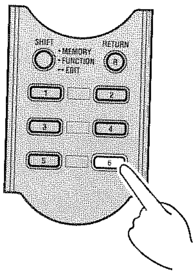
- It is possible to register up to 100 discs using the ADPS function of the multi-CD player.
  (It is possible to register up to 100 discs together with disc titles (see page 39).)
- When the number of discs exceeds 100, discs not being played (Information not being renewed) in memory is overwritten by the newest.
- Up to 99 tracks may be stored in memory under one disc.
- Storing tracks in memory can be conducted for each disc. Bear in mind that even if you replace the disc of the magazine, the information stored under that disc cannot be erased.

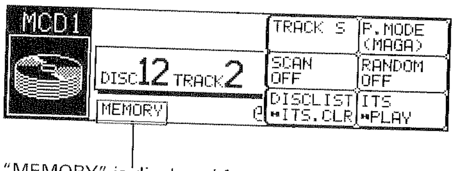
A1

❖ Storing track information in memory

Storing track information in memory must be conducted during operations other than ITS play. (Storing tracks in memory is even possible during scan play and random play.)

1. **Play the track desired to be stored in memory.**
2. **Press Function button/6 to store the track in memory.**





"MEMORY" is displayed for about 2 seconds to show that the track has been stored.

ADPS functions

> The Automatic Disc Program Selection (ADPS) function stores information about discs in memory. (This unit can store information of ITS and disc title in memory.)

> Discs whose information is stored in memory are registered under the multi-CD player (when more than one unit is connected, the memory is stored in Address 1), together with their contents. The system can hold information on 100 discs maximum. (If a single-CD is connected, it is included.)

A1

❖ Performing ITS play

Track stored only in memory are played in order.
ITS play is performed as follows during current play mode (repeat mode).

Play mode (repeat mode)	Tracks targeted for ITS play
One track repeat (REPEAT)	↓ (When ITS play is conducted, the play mode switches to disc repeat mode.)
Disc repeat (DISC)	Tracks stored in memory on the disc being played.
Magazine repeat (MAGA)	Tracks stored in memory from all the discs in the magazine being played. > When there are no tracks stored in memory on the disc being played, the system switches to the next disc having tracks stored in memory.
ALL repeat* (ALL)	Tracks stored in memory from among all the discs in all the magazines in multi-CD 1 to multi-CD 4. > When there are no tracks stored in memory for the disc (multi-CD) being played, the system switches to the next disc (multi-CD) having tracks stored in memory.

* When 2 or more multi-CD players are connected.

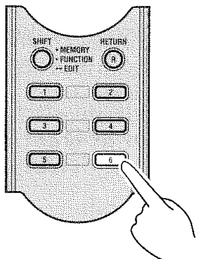
1. Switch play mode (repeat mode).

(see page 33.)

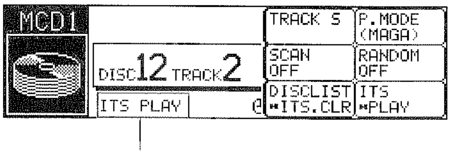
Select play mode for the desired ITS play.

2. Hold down Function button/6 for at least 2 seconds to commence ITS play.

Press the button again to cancel.



For at least 2 seconds.



"ITS PLAY" is displayed during ITS play.

When there are no tracks stored in the selected repeat mode playback area memory

> When attempting to perform ITS play, "NO. PROGRAM" is displayed for about 2 seconds to indicate that ITS play cannot be conducted.

During ITS play

> When switching between multi-CD players, disc number and track searches are conducted for tracks stored in memory.

A1

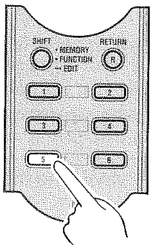
❖ Erasing one track from memory

A track being played can be erased from memory during ITS play.

1. **Conduct ITS playback.**
   (see page 37.)

2. **Play the track to be erased.**
   Play the track to be erased from memory using disc number search and track search.

3. **Hold down Function button/5 for at least 2 seconds to erase the track.**
   > When no stored tracks remain to be played under the current repeat mode, "NO.PROGRAM" displays for about 2 seconds and ITS playback is canceled.


SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT
R
1
2
3
4
5
6

For at least 2 seconds.

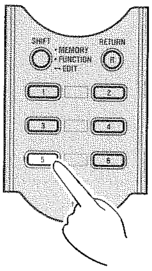
A1

❖ Erasing disc data from memory

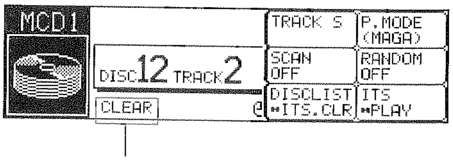
It is possible to erase from memory all the track information stored about the disc being played, if ITS play is not in operation.

1. **Play the relevant disc.**
   Play the disc whose information is to be erased from memory, using disc number search.
   > If ITS play is in operation, cancel it (see page 37).

2. **Hold down Function button/5 for at least 2 seconds to erase the disc details.**


SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT
R
1
2
3
4
5
6

For at least 2 seconds.


MCD1
TRACK 5
P.MODE (MAGA)
DISC12 TRACK2
SCAN OFF
RANDOM OFF
CLEAR
DISCLIST ••ITS.CLR
ITS ••PLAY

"CLEAR" is displayed for about 2 seconds to indicate that the disc information has been erased.

Inputting disc titles

It is possible to input and store in memory disc titles of the discs in the multi-CD player. When a disc is played whose title has been stored, its title is displayed.

- It is possible to register up to 100 discs using the ADPS function of the multi-CD player. (It is possible to register up to 100 discs with ITS (see page 36).)

> For ADPS function, see page 36.

- When the number of discs exceeds 100, discs not being played (Information not being renewed) in memory is overwritten by the newest.
- Titles of discs can be stored in memory with up to 10 characters for each disc.
- Storing titles in memory can be conducted for each disc. Bear in mind that even if you replace the disc of the magazine, the information stored under that disc cannot be erased.

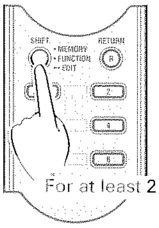
A1

❖ Inputting titles (Switching to edit mode) L1

Inputting titles is conducted in edit mode.

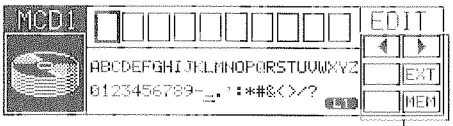
1. **Play the disc whose title is to be input.**
2. **Hold down the SHIFT button for at least 2 seconds to switch to edit mode.**

   The display switches to L1: character input screen to allow input of disc titles.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN

For at least 2 seconds.

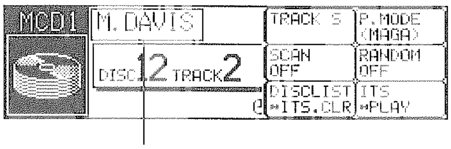
L1: Character input screen


MCD1
EDIT
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789-_.':*#&<>/?
EXT
MEM
L1

Function buttons display

3. **Input titles to store them in memory**

   Input titles by referring to page 23.
4. **The disc title stored in memory is indicated on the display.**


MCD1
M.DAVIS
DISC 12 TRACK 2
TRACK S
P.MODE <MAGA>
SCAN OFF
RANDOM OFF
DISCLIST →ITS.CLR
ITS →PLAY

The title stored in memory is displayed.

A1

❖ Displaying the disc title list

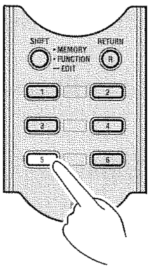
A2

It is possible to display a list of all the discs in the magazine being played.
This is a convenient function for checking which discs are stored in the magazine being played.

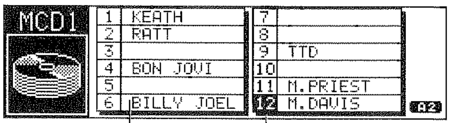
Press Function button/5 to display the disc list.

The display switches to A2: disc list screen to show disc titles.

> Only numbers are displayed for discs whose titles have not been input or if the tray does not contain a disc.



A2: Disc list screen


MCD1
1 KEATH
2 RATT
3
4 BON JOVI
5
6 BILLY JOEL
7
8
9 TTD
10
11 M.PRIEST
12 M.DAVIS
A2

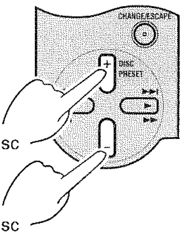
Disc number being played are displayed in reverse type.

Where titles have been stored into memory, the titles are displayed.

A2

❖ Selecting discs for play from the disc list

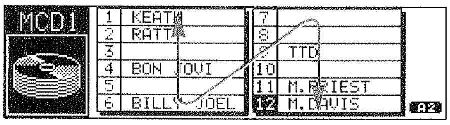
Press the +/– buttons to scroll through the discs in order/reverse order.



To the next disc

To the previous disc

– button

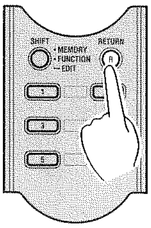

MCD1
1 KEATH
2 RATT
3
4 BON JOVI
5
6 BILLY JOEL
7
8
9 TTD
10
11 M.PRIEST
12 M.DAVIS
A2

+ button

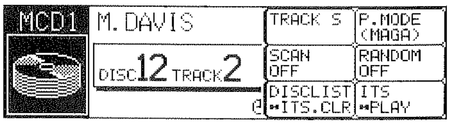
A2

❖ Returning to the multi-CD operation screen.

Press the RETURN button to return to A1: multi-CD operation screen.



A1: Multi-CD operation screen


MCD1
M.DAVIS
DISC 12 TRACK 2
TRACK S
P.MODE (MAGA)
SCAN OFF
RANDOM OFF
DISCLIST ↔ITS.CLR
ITS ↔PLAY

When the disc list is displayed

> The SHIFT button and Function buttons cannot be used.

Using the tape deck

Before listening to a cassette

Handling cassettes

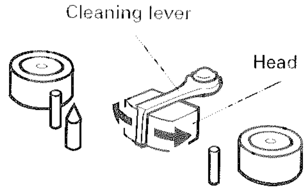
- Keep cassettes away from magnets and other sources of magnetism.
- Do not leave cassettes in direct sunlight.
- When a cassette is not in use, do not leave it out, but return it to its box for storage.

Before inserting a cassette

- Do not insert a cassette whose label is peeling or coming unstuck at any point. If the label catches in the mechanism, the cassette will not eject. Remove a peeling label completely before using a cassette.
- Do not use C-120 (120 min.) tapes. Because the tape is exceptionally thin it stretches, giving poor performance.

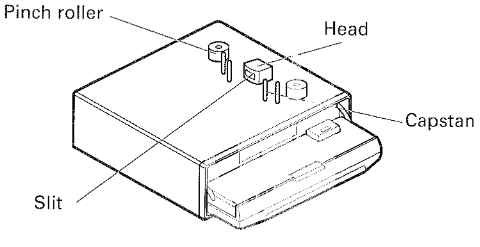
❖ Automatic tape head cleaning (Auto head cleaning mechanism)

This unit incorporates an automatic tape head cleaning mechanism.
When the tape switches from side A to side B, the tape head cleaning lever moves onto the head, keeping the head free of dirt.



If the sound quality deteriorates

- If the heads become dirty, the sound quality will deteriorate and there will be sound drop-outs and other imperfections in performance. If this happens, it is possible that some dirt is stuck to the head that the cleaning lever is unable to remove. In this case, the head must be cleaned manually.
- The head is located on the right side of the tape slot, approximately halfway between the front of the unit and the back.



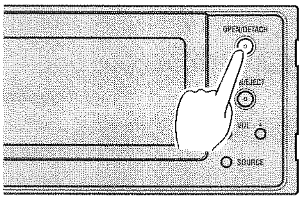
Caution when cleaning

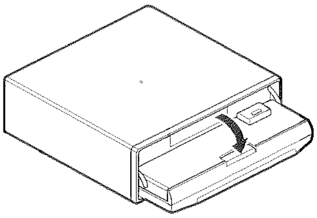
- Don't use metal or a magnet on the head. Never use tweezers or pliers wrapped with cotton or gauze. This can scratch the head.
- When using a cleaning tape, play it once on one side for normal cleaning. Excessive use of the cleaning tape will increase head wear. Be sure to read the cleaning tape instructions before use.

Tape playback ON/OFF

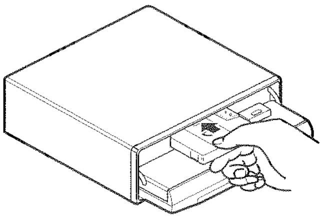
❖ Inserting the cassette tape

1. **Press the OPEN/DETACH button to open the display.**


OPEN/DETACH
▲/EJECT
VOL
SOURCE

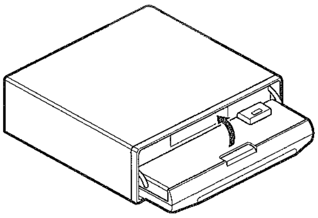


2. **Partially insert the cassette tape.**

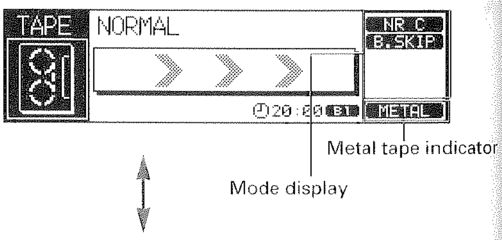


3. **The display automatically closes and tape playback begins.**

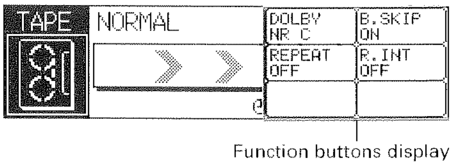
After the title screen, the display switches to B1: tape operations screen. Opening and closing the cover of the SYSTEM COMMUNICATOR switches between the open and closed states of the menu display.



B1: Tape operations screen (closed state)


TAPE
NORMAL
NR C
B.SKIP
20:00
B1
METAL
Metal tape indicator
Mode display

B1: Tape operations screen (open state)


TAPE
NORMAL
DOLBY NR C
B.SKIP ON
REPEAT OFF
R.INT OFF
Function buttons display

When a cassette tape is already inserted

> Press the TAPE button to switch tape playback ON/OFF (switching the source). (See page 26.)

If a damaged cassette tape is inserted

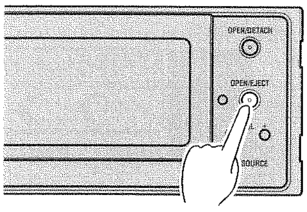
> When a damaged cassette tape is inserted (broken or twisted, for example) the power will turn OFF and playback will not start. Remove the cassette and check the tape.

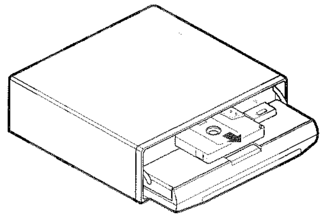
Metal tape indicator (auto tape selector)

> When a tape is inserted, this unit automatically identifies the tape type (metal/chrome or normal) and sets the appropriate playback equalizer for that type of tape (70 µs/120 µs). When the tape is metal or chrome, the metal tape indicator lights up on the display.

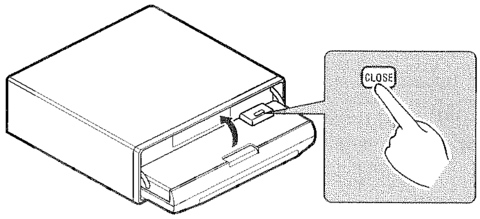
❖ Ejecting the cassette tape

1. **Press the OPEN/EJECT button to eject the tape.**
   The display automatically opens and the tape ejects.


OPEN/DETACH
OPEN/EJECT
SOURCE



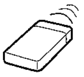
2. **Taking out the cassette tape.**
3. **Press the CLOSE button to close the display.**



When the ignition is turned OFF

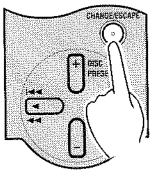
> The tape can be ejected within 30 seconds of turning the ignition off.

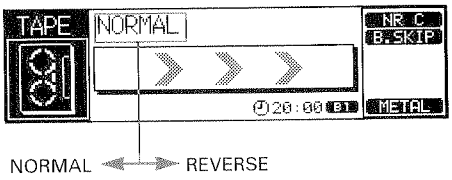
B1 Switching between sides A and B (Tape direction)



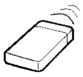
Press the CHANGE/ESCAPE button to switch between sides A and B.

> The CHANGE/ESCAPE button is also used to cancel the fast forward, rewind, music search and repeat playback functions. Pressing the button while these functions are in operation will not switch between sides A and B.

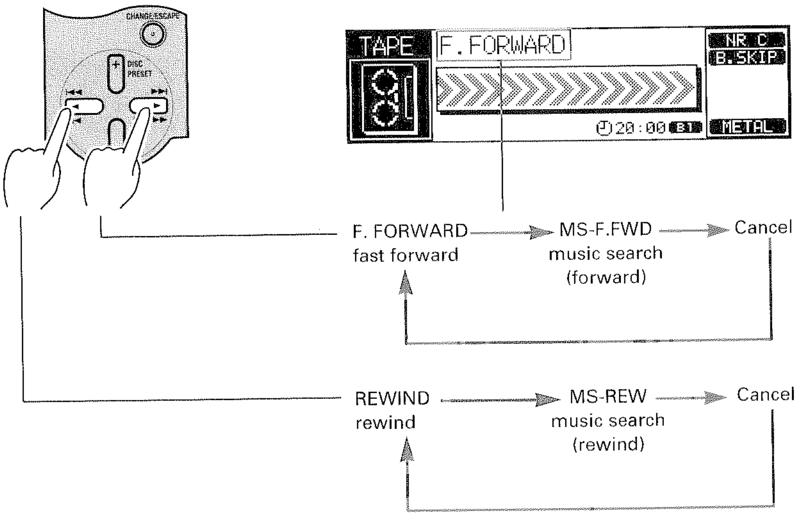

CHANGE/ESCAPE
DISC
PRESE


TAPE
NORMAL
NR C
B.SKIP
20:00
B1
METAL
NORMAL
REVERSE

B1 Using fast forward, rewind and music search

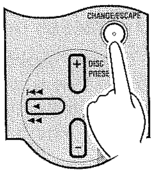


Pressing the ◀ ▶ buttons will perform the following sequence of operations:


CHANGE/ESCAPE
DISC
PRESET
TAPE
F.FORWARD
NR C
B.SKIP
20:00
B1
METAL
F. FORWARD
fast forward
MS-F.FWD
music search
(forward)
Cancel
REWIND
rewind
MS-REW
music search
(rewind)
Cancel

Another way to cancel operations

> Fast forward/rewind and music search can be canceled by pressing the CHANGE/ESCAPE button.


CHANGE/ESCAPE
DISC
PRESE

Music search does not operate correctly with the following kinds of tapes:

> Tapes with the following recording characteristics do not enable the music search function to detect the intervals between tracks, and the music search function may therefore not work correctly:
- Tapes with gaps of 4 seconds or less between tracks.
- Tracks in which the sound stops for 4 seconds or longer (conversation, for example).
- Tracks within which the sound drops to a very low level for 4 seconds or more.

B1 Dolby NR system

Dolby-B NR and Dolby-C NR systems both reduce hiss noise from tapes.

> Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "DOLBY" and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation.

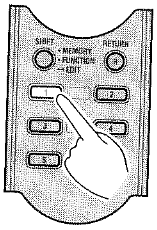
Dolby-B NR

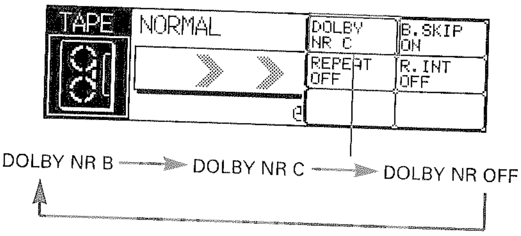
Turn the Dolby-B NR ON while playing tapes recorded with Dolby-B NR ON.

Dolby-C NR

Turn the Dolby-C NR ON while playing tapes recorded with Dolby-C NR ON.

Press Function button/1 to switch the mode as follows:


SHIFT
RETURN
• MEMORY
• FUNCTION
→ EDIT
R
1
2
3
4
5

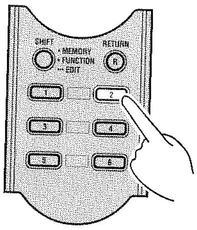

TAPE
NORMAL
DOLBY NR C
B.SKIP ON
REPEAT OFF
R.INT OFF
DOLBY NR B
DOLBY NR C
DOLBY NR OFF

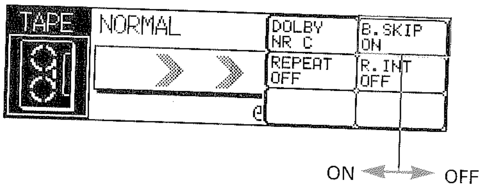
> In the closed state, "NR B" is displayed when Dolby-B NR is ON and "NR C" is displayed when Dolby-C NR is ON.

B1 Blank skip

This function automatically skips over the non-recorded part between tracks when the gap is 12 seconds or longer.

Press Function button/2 to switch the mode ON/OFF.


SHIFT
RETURN
• MEMORY
• FUNCTION
→ EDIT
R
1
2
3
4
5
6

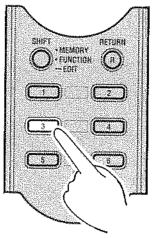

TAPE
NORMAL
DOLBY NR C
B.SKIP ON
REPEAT OFF
R.INT OFF
ON
OFF

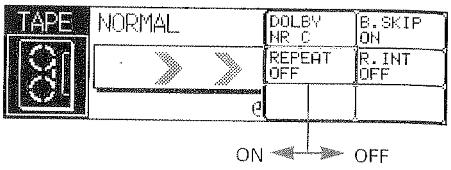
> In the closed state, "B. SKIP" is displayed when the blank skip is ON.

B1 Repeat playback

This function is used to repeat the playing of a track.

Press Function button/3 to switch ON/OFF.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6


TAPE
NORMAL
DOLBY NR C
B.SKIP ON
REPEAT OFF
R.INT OFF
ON
OFF

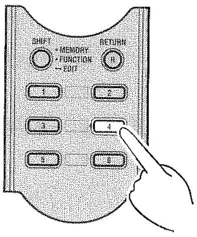
> In the closed state, "REPEAT" is displayed when the repeat playback is ON.

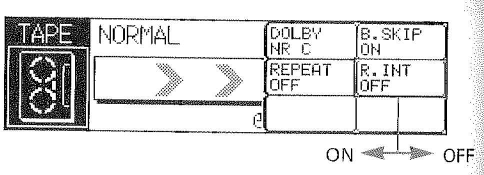
B1 Listening to the radio during fast forward/rewind (radio intercept)

During fast forward/rewind of a tape, it is possible to listen to the radio. When the radio intercept is ON, the unit automatically switches to the radio during fast forward/rewind of a tape.

> While the radio intercept is in operation, the display indicates radio.

Press Function button/4 to switch ON/OFF.

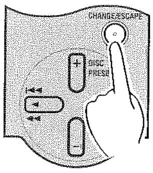

SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6


TAPE
NORMAL
DOLBY NR C
B.SKIP ON
REPEAT OFF
R.INT OFF
ON
OFF

> In the closed state, "R.INT" is displayed when radio intercept is ON.

Other methods of canceling repeat playback

> Fast forward/rewind and music search also cancel the repeat playback function.
> Pressing the CHANGE/ESCAPE button also cancels the repeat playback function.


CHANGE/ESCAPE
DISC
PRESET

The repeat function does not operate correctly with the following kinds of tapes:

> Tapes with the following recording characteristics do not enable the repeat function to detect the intervals between tracks, and the repeat function may therefore not work correctly:
- Tapes with gaps of 4 seconds or less between tracks.
- Tracks in which the sound stops for 4 seconds or longer (conversation, for example).
- Tracks within which the sound drops to a very low level for 4 seconds or more.

Using the tuner

Electric Tuner

Frequency allocation deffers depending upon the area. This unit has been designed in accordance with the frequency allocations for Western Europe, Asia, the Middle and Near East, Africa, Australia and Oceania. Use in other areas may result in improper reception of AM.
The RDS function does not work in the areas where RDS broadcast services are unavailable.

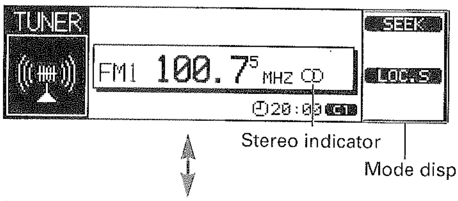
Radio ON/OFF C1

Press the TUNER button to switch the source to radio.

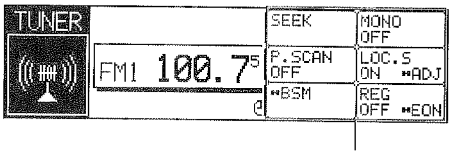
(See page 26.)

After the title screen, the display switches to C1: radio reception screen. Opening and closing the cover of the SYSTEM COMMUNICATOR switches between the open and closed states of the menu display.

C1: Radio reception screen (closed state)


TUNER
SEEK
FM1 100.7⁵ MHZ
LOC.S
20:00
C1
Stereo indicator
Mode display

C1: Radio reception screen (open state)

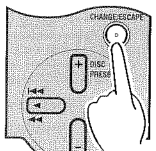

TUNER
FM1 100.7⁵
SEEK
MONO OFF
P.SCAN OFF
LOC.S ON ADJ
BSM
REG OFF EON

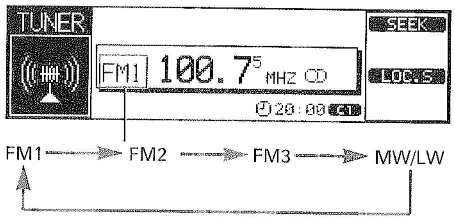
Function buttons display

C1 Selecting the band

Press the CHANGE/ESCAPE button to switch the mode as follows:

MW and LW are combined in one band.


CHANGE/ESCAPE
DISC
PRESET


TUNER
SEEK
FM1 100.7⁵ MHZ
LOC.S
20:00
C1
FM1
FM2
FM3
MW/LW

Receiving FM stereo broadcasts

> When the unit receives an FM stereo broadcast, the stereo indicator "ↀ" lights up on the display.

The FM frequency band

> The FM band is replicated into FM1, FM2 and FM3. This enables one memory button to store the reception frequencies for three radio stations. The reception frequency range is the same for bands 1, 2 and 3. (See page 50 for storing radio station frequencies in memory.)

C1 Selecting a radio station

There are two ways to select a radio station.

Seek tuning

The unit automatically selects stations whose signal intensity exceeds a certain threshold.

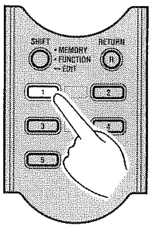
Manual tuning

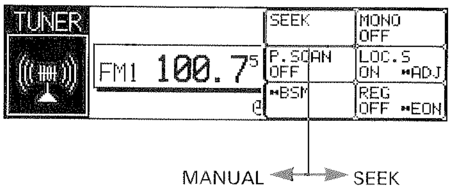
The frequency is selected manually. Use this function to tune into stations whose signal intensity is low, and which would therefore be skipped by the seek tuning procedure.

> Switching between these two modes cannot be conducted unless the cover of the SYSTEM COMMUNICATOR is open and the menu displays open state. However, a radio station can be selected even when the cover is closed.

1. Press Function button/1 to select a mode.

Press the button to switch mode.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
R
1
2
3
4
5


TUNER
FM1 100.75
SEEK
P.SCAN OFF
BSM
MONO OFF
LOC.S ON ADJ
REG OFF EON
MANUAL
SEEK

> In the closed state, each mode is displayed.

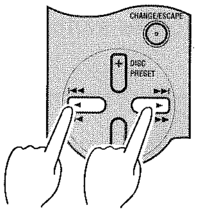
2. Select radio stations by pressing the ◀ ▶ buttons.

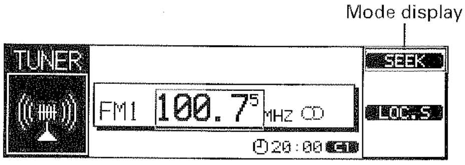
When seek tuning:

When a strong enough signal is received, the seek tuning automatically stops. Press again to cancel while in seek tuning.

When manual tuning:

Hold down the buttons to change frequency swiftly.


CHANGE/ESCAPE
DISC
PRESET
To lower frequencies
To higher frequencies


Mode display
TUNER
FM1 100.75 MHZ
20:00
C1
SEEK
LOC.S

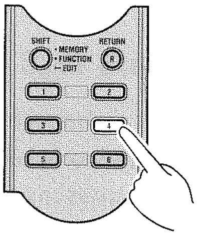
Adjusting reception sensitivity (local seek tuning)

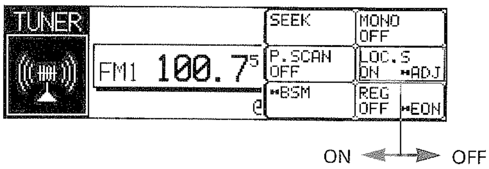
In local mode, the seek tuning reception threshold becomes higher, restricting selection to radio stations with relatively strong signals. This function is convenient for example at night or, when signals from many stations are received weakly but with so much noise that they are selected during seek tuning.
The sensitivity level in local mode can be adjusted in 4 steps for FM and 2 steps for MW/LW.

C1

❖ Switching to local mode

Press Function button/4 to switch local mode ON/OFF.


SHIFT
RETURN
MEMORY
FUNCTION
EDIT
1
2
3
4
5
6


TUNER
FM1 100.7⁵
SEEK
P.SCAN OFF
BSM
MONO OFF
LOC.S ON ADJ
REG OFF EON
ON
OFF

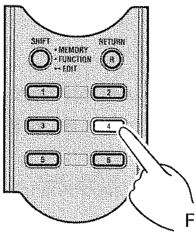
> In closed state, "LOC.S" is displayed when local mode is ON.

C1

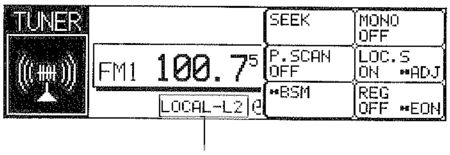
❖ Adjusting the sensitivity level in local mode

1. **Hold down Function button/4 for at least 2 seconds to switch to sensitivity level adjustment mode.**

Pressing the button again cancels the function. If no level adjustment is performed for about 5 seconds, the function is automatically canceled.


SHIFT
RETURN
MEMORY
FUNCTION
EDIT
1
2
3
4
5
6

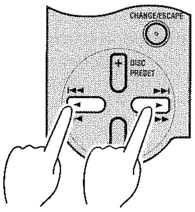
For at least 2 seconds.


TUNER
FM1 100.7⁵
LOCAL-L2
SEEK
P.SCAN OFF
BSM
MONO OFF
LOC.S ON ADJ
REG OFF EON

The current sensitivity level is displayed.

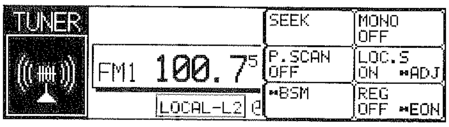
2. **Adjusting the sensitivity level with the ◀ ▶ buttons**

FM can be adjusted to one of 4 levels (L1 — L4), and MW/LW can be adjusted to one of 2 levels (L1 and L2). The higher the level, the higher the signal threshold for station selection. Choosing a low level allows reception from radio stations with weak signals.


CHANGE/ESCAPE
DISC
PRESET

To a lower sensitivity level

To a higher sensitivity level


TUNER
FM1 100.7⁵
LOCAL-L2
SEEK
P.SCAN OFF
BSM
MONO OFF
LOC.S ON ADJ
REG OFF EON

Storing radio station frequencies in memory

18 FM stations (6 stations each in FM 1, 2, and 3) and 6 MW/LW stations can be stored in memory using Function buttons/1-6.
There are two ways to store radio station frequencies in memory.

Storing the station currently being received (preset memory)

Select, by seek tuning or manual tuning, the station whose frequency is to be stored.

Automatically store 6 stations in memory (BSM: Best Stations Memory)

Tune automatically to stations with strong signals using the selected band and store their frequencies in memory using Function buttons/1-6.

C1

❖ Using the preset memory

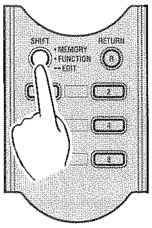
1. **Select the band.**

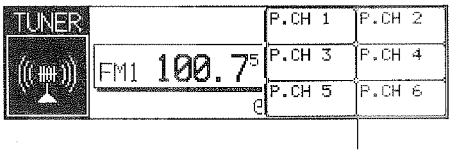
   Select FM1, 2 or 3, or MW/LW.

2. **Selecting the station whose frequency is to be stored.**

   Select, by seek tuning or manual tuning, the station whose frequency is to be stored.

3. **Press the SHIFT button to change the display to the preset number display.**

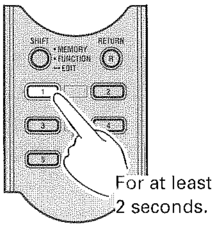

SHIFT
•MEMORY
•FUNCTION
—EDIT
RETURN


TUNER
FM1 100.7
P.CH 1
P.CH 2
P.CH 3
P.CH 4
P.CH 5
P.CH 6

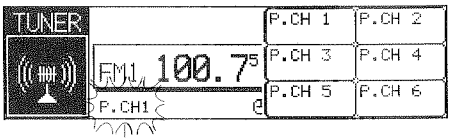
Preset number display

4. **Choose a Function button under which the station frequency is to be stored, and hold the button down for at least 2 seconds to store the frequency.**

   > If a station frequency is already stored in that memory it is replaced by the new frequency.


SHIFT
•MEMORY
•FUNCTION
—EDIT
RETURN
For at least 2 seconds.

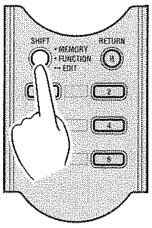
Example: Storing under preset number 1

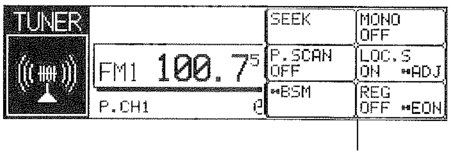

TUNER
FM1 100.7
P.CH1
P.CH 1
P.CH 2
P.CH 3
P.CH 4
P.CH 5
P.CH 6

The flashing stops when the process of storing the information in memory is complete.

5. **Press the SHIFT button again to cancel the preset number display.**

   The Function buttons display returns.


SHIFT
• MEMORY
• FUNCTION
— EDIT
RETURN
2
4
6


TUNER
FM1 100.75
P.CH1
SEEK
P.SCAN OFF
•BSM
MONO OFF
LOC.S ON •ADJ
REG OFF •EON

Function buttons display

C1

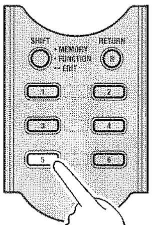
❖ Using Best Stations Memory (BSM)

1. **Select a band.**

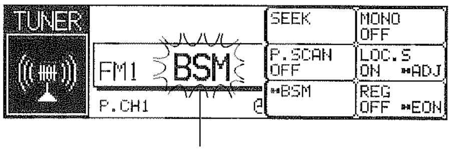
   Select FM 1, 2 or 3, or MW/LW.

2. **Hold down Function button/5 for at least 2 seconds to begin BSM.**

   Tune automatically to stations with strong signals using the selected band and store their frequencies in memory using Function buttons/1-6. Pressing the button again while in BSM cancels the function.


SHIFT
• MEMORY
• FUNCTION
— EDIT
RETURN
1
2
3
4
5
6

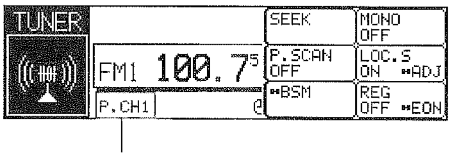
For at least 2 seconds.


TUNER
FM1 BSM
P.CH1
SEEK
P.SCAN OFF
•BSM
MONO OFF
LOC.S ON •ADJ
REG OFF •EON

The flashing stops when the process of storing the information in memory is complete.

> BSM will continue even if the SYSTEM COMMUNICATOR cover is closed this period.

3. **The unit registers preset number 1 when the recording in memory is complete.**


TUNER
FM1 100.75
P.CH1
SEEK
P.SCAN OFF
•BSM
MONO OFF
LOC.S ON •ADJ
REG OFF •EON

The unit receives the station whose frequency has been recorded under Function button/1.

BSM functions

> Recording with Function buttons/1-6 is performed beginning with stations transmitting stronger signals.

> When there are fewer than six stations with strong signals, previously stored information may remain in memory.

> In regions having only a small number of radio stations transmitting strong signals, it may take almost 30 seconds to complete BSM.

A convenient way to confirm correct storage of station frequencies

> When BSM is complete, preset scan tuning permits easy confirmation that the correct frequency has been stored in memory. (See page 53 for preset scan tuning.)

Recalling a stored radio station in memory

There are three ways to tune to stations stored in memory.

In forward/reverse order (preset tuning -1)

Retrieve stored station frequencies using forward in order/reverse order of preset numbers.

> This is convenient when function buttons cannot be used while the SYSTEM COMMUNICATOR is in the remote control state.

Specifying preset numbers directly (preset tuning -2)

This can be done when the cover of the SYSTEM COMMUNICATOR is open and the menu displays open state. Directly recall the preset number of the desired station.

Recalling stations one after another (preset scan tuning)

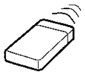
Recall stations stored under preset numbers 1-6 one after another, for about 8 seconds per station.
This is convenient when checking which stations are stored in memory or when browsing in search of an interesting program.

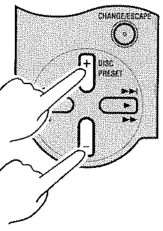
C1

❖ Selecting a frequency using forward/reverse order (preset tuning -1)

Press the +/– buttons in forward/reverse order through the preset numbers.

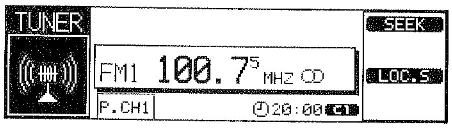
Holding down the +/– buttons continues the action.





To the next preset number

To the previous preset number

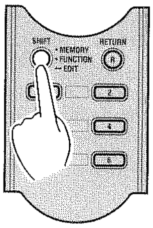


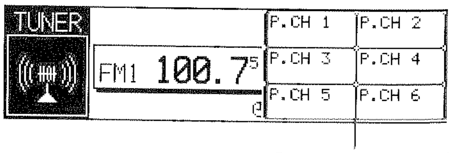
C1

❖ Directly specifying preset numbers (preset tuning -2)

1. **Press the SHIFT button to display the preset number.**

   Press the button to switch between the Function buttons display and the preset numbers.

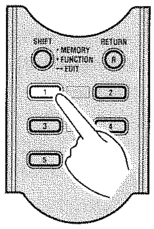




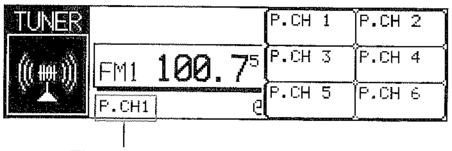
Preset number display

2. **Select preset numbers using Function buttons/1-6.**

Select the preset numbers of the desired stations.


SHIFT
• MEMORY
• FUNCTION
•• EDIT
RETURN
R
1
2
3
4
5

Example: Selecting preset number 1


TUNER
FM1 100.75
P.CH1
P.CH 1
P.CH 2
P.CH 3
P.CH 4
P.CH 5
P.CH 6

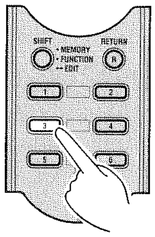
The selected preset number is displayed.

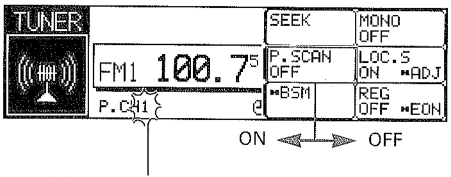
C1

❖ Recalling radio stations one after another (preset scan tuning)

1. **Press Function button/3 to begin preset scan tuning.**

Recall the stations stored in memory one after another for about 8 seconds per station.


SHIFT
• MEMORY
• FUNCTION
•• EDIT
RETURN
R
1
2
3
4
5
6


TUNER
FM1 100.75
P.CH1
SEEK
MONO OFF
P.SCAN OFF
LOC.S ON ••ADJ
••BSM
REG OFF ••EON
ON
OFF

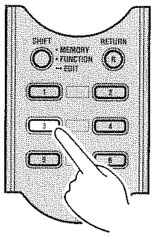
The recalled preset number flashes.

> In closed state, "P.SCAN" is displayed during preset scan tuning.

2. **When the tuner picks up a desired program, press Function button/3 again to cancel the scan.**

The tuner will then remain tuned to the current station.

> Preset scan tuning will continue unless it is canceled.


SHIFT
• MEMORY
• FUNCTION
•• EDIT
RETURN
R
1
2
3
4
5
6

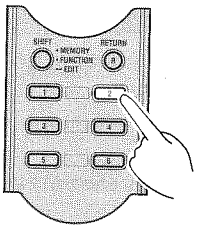
If reception is poor on one frequency

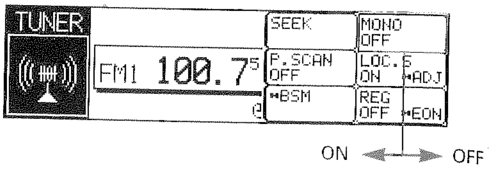
> The preset number of a station is automatically skipped when the reception is poor while carrying out preset scan tuning.

C1 Switching to monaural reception mode

If an FM stereo broadcast suffers from considerable noise, switch to monaural reception mode. This reduces the noise.

Press Function button/2 to switch monaural mode ON/OFF.


SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT
1
2
3
4
5
6


TUNER
SEEK
MONO OFF
FM1 100.7
P.SCAN OFF
LOC. 5 ON
ADJ
BSM
REG OFF
EON
ON
OFF

> In the closed state, "MONO" is displayed when monaural reception mode is selected.

Using the RDS function — FM functions —

❖ What is RDS?

RDS (Radio Data System) according to a CENELEC EN50067 is a system for transmitting data signals from FM broadcast transmitter along with the normal sound program. These data signals, which are imperceptible to listeners, are intended to aid radio listeners in tuning their receivers to a desired station. RDS receivers can decode these data signals for display or control purposes.
RDS digital signal includes various data, such as PI, PS, AF, TP, TA and EON.

PI .... **Program Identification Code**
PS .... **Program Service Name**
AF .... **List of Alternative Frequencies**
TP .... **Traffic Program Identification Code (Similar to SK signal of ARI system)**
TA .... **Traffic Announcement Code (Similar to DK signal of ARI system)**
EON .... **Enhanced Other Network Information Code (In some countries, EON is not offered by broadcasters.)**

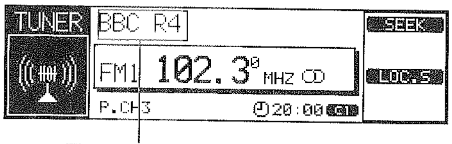
❖ RDS function of this unit

This unit has the following functions for making use of RDS data.

- PS, the name of the currently listened station is displayed.
- AF (Alternative Frequency) function. This enables the receiver to automatically retune to more suitable frequencies transmitting the same program.
- TP/TA, EON, user selectable reception of the traffic information service, offered by RDS.

❖ Network/Station name display

Switch the tuner on and choose one of the three FM bands.
When you tune into an RDS station with manual or seek tuning, the display will show the network/station name after a few seconds by means of the PS code.



The network/station name is displayed.

The RDS function may not work in the following instances:

> The RDS function of this unit use RDS codes transmitted along with FM broadcasts. RDS doesn't work on the MW or LW bands.

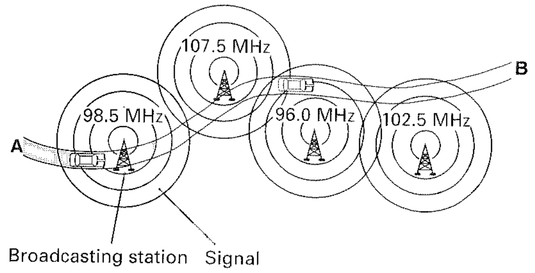
> The RDS functions may not work properly in areas where the RDS transmission are at an experimental stage or where there are flaws in the broadcasting system.

❖ AF function

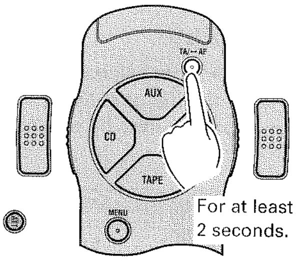
The receiver retunes automatically to a more suitable transmitter, contained in the list of Alternative Frequencies (AF), to enable the motorist to keep listening to programs in the same network. (The AF function is selected initially.)

Example:

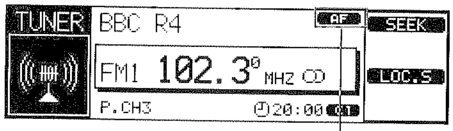
If a motorist travels as shown below, from point A to point B, (and has selected AF function) then the receiver will automatically retune to a more suitable frequency transmitting the same program. This is shown by the automatic retuning from 98.5 MHz to 107.5 MHz to 96.0 MHz to 102.5 MHz.



Holding down the TA button for at least 2 seconds switches the AF function ON/OFF.



For at least 2 seconds.



"AF" turns ON when the AF function is selected.

When selecting the AF function

Once tuned to a RDS station, as long as you drive within an area served by the same network, the receiver will automatically retune to a more suitable station transmitting the same program, by utilizing the data in the AF list.

"PI SEEK" display

> "PI SEEK" will appear on the display, if the AF function has been selected, and a suitable AF station cannot be found. In this case, the receiver will mute the radio sound and search the frequency band, in order to find a station with the same PI code. The receiver will return to the original frequency if the same or related PI code can not be found.

The AF function will not work in the following case:

> when the receiver is tuned to a non-RDS station. (local station)
In this case, "AF" indicator will flash on the display, thus indicating that the AF function cannot be performed.

C1

❖ Preset recall

When recalling preset stations in the AF mode

The tuner will be tuned to the stored frequency and the AF function will be operative, i.e. when the signal of the recalled station is weak or has a different PI, the radio will look into the AF list and is necessary start a PI-seek in order to find a station with the same or related PI code. When the tuner is performing a PI seek "PI SEEK" is shown on the display.

- If the PI seek is successful, the tuner will be tuned to the new frequency that transmits the same program service (i.e. with the same PI code) and the display will show the stored PS.
- If the PI seek is not successful, the tuner will return to the stored frequency. If a new station (with a different PI code) would be received on this frequency, this station will become audible. In this case, PS is not displayed.

When recalling preset stations in the AF = OFF mode

the tuner will be tuned to the stored frequency and the display will show the stored PS. In case the tuned station has a PI code that is different from the stored one, the tuner will accept the new PI code and stay tuned to the initial frequency. The display will show the new PS when the signal of the tuned station is strong enough.

C1

❖ Listening to regional stations

In some countries a particular program service may "opt out" during a certain part of the day in several regional variants at particular locations. Since these regional variants are broadcasting a different program they temporally have a PI and a PS that is different from the main program service. The PI's are mostly "generically linked". The AF list may either be common for all regional variants or each regional variant may have its own AF list.
In other countries there may be regional stations which are not an "opt out" of a particular main program service but which have an independent existence. These regional stations all have a different PS. Their PI's may be "generically linked" and their AF lists may carry frequencies which are alternatives for that regional station only. (The initial setting is REG OFF mode.)

1) Regional OFF mode

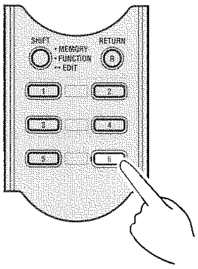
In this case the receiver will switch automatically to regional variants of the tuned program service along the journey. This is of benefit when the regional variants just carry the same program, but will become annoying if the receiver switches back and forth between different programs. In this case it is recommended to put the receiver in the REG ON mode.

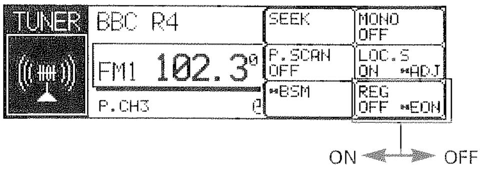
2) Regional ON mode

When the radio is put in the REG ON mode, the radio will remain tuned to a specific regional variant as long as it is available.

Pressing Function button/6 while in AF mode switches to REG ON mode.

Press the button again to switch to REG OFF mode.

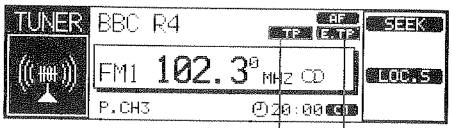




Traffic information reception

TP and EON-TP functions

When a traffic information station (TP station) is selected, "TP" lights on the display, thus indicating traffic reports can be received through this station. The "E.TP" indicator will light on the display when a selected station (this network) is broadcasting EON information which cross-references at least one program service which carries traffic information, thus indicating traffic reports can be received through another program service by using the EON function of this unit.


TUNER
BBC R4
AF
TP
E.TP
SEEK
FM1 102.3 MHz CD
LOC.S
P.CH3
20:00
C1

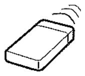
"TP" turns ON when a traffic information station is selected.

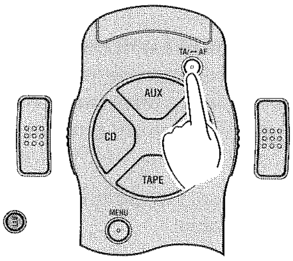
"E.TP" turns ON when the selected station transmits EON information.

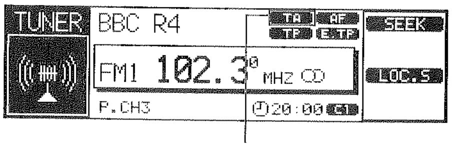
❖ Switch to traffic report waiting status

Press the TA button to switch to traffic report waiting status.

Press the button again to cancel.




TA/—AF
AUX
CD
TAPE
MENU


TUNER
BBC R4
TA
AF
TP
E.TP
SEEK
FM1 102.3 MHz CD
LOC.S
P.CH3
20:00
C1

"TA" is displayed while in traffic report waiting status.

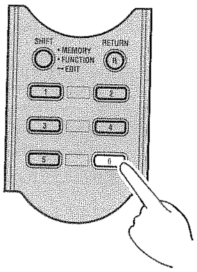
C1

Turning the EON function ON/OFF

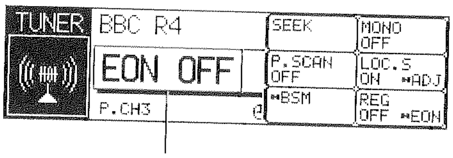
If you wish not to interrupt your radio program (eg: classical music program) by traffic report, the EON function of this unit can be set to OFF.

Press down Function button/6 for at least 2 seconds during traffic report waiting status to turn the EON function OFF.

Press the button down again for at least 2 seconds to turn the EON function ON.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6

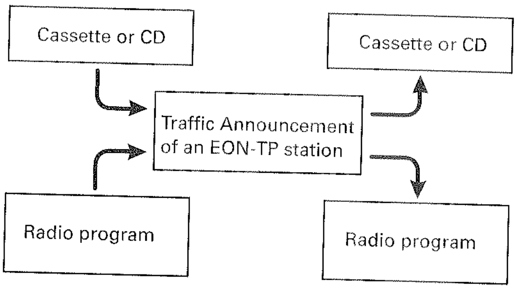
For at least 2 seconds.


TUNER
BBC R4
EON OFF
P.CH3
SEEK
MONO OFF
P.SCAN OFF
LOC.S ON ADJ
BSM
REG OFF EON

The current status is displayed for about 3 seconds.

If only the "E.TP" indicator is ON but the EON function of this unit is OFF, it is not possible to receive traffic report through another program service. In this case, "TA" (if traffic report waiting status is set to ON) will flash on the display to indicate this situation.

Traffic information reception by EON-TP


Cassette or CD
Cassette or CD
Traffic Announcement of an EON-TP station
Radio program
Radio program

Traffic announcement volume adjustment

The volume of the traffic Announcement can be adjusted during the reception of a traffic report. The next time that a report is received, the volume will be at the previous setting. However, if the preset volume of the traffic reception is below that of the present source, the volume of the traffic reception will not decrease, and the preset volume of the traffic reception will be set to that of the source.

TP alarm function

In TA mode, about 30 seconds after "TP" disappears from the display, which occurs if the signal from the TP station becomes weak, an alarm sounds for 10 seconds to tell you to tune to another TP station.

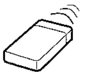
When a traffic report is received

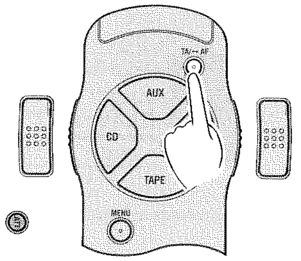
- > The display switches to F1: traffic report reception screen.
- > The operations of the TA button and Function button/6 can be conducted during traffic information reception.

TA reception while listening to other sources

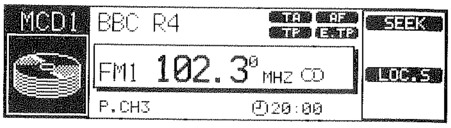
If the radio is already set to the FM band and tuned to a TP or EON-TP station, even when listening to the cassette or CD, when the TA button is pushed ("TA" is shown on the display), traffic report waiting will begin.

> When the TA button is pressed, the display switches to the tuner operation screen for about 8 seconds. It is then possible to carry out tuner operations other than switching bands (CHANGE/ESCAPE button). Conducting further operations prolongs them by another 8 seconds.





Example: When the TA button is pressed while the CD is playing.



When a traffic report begins, the system will switch from cassette or CD to the traffic report.

❖ BSA function

When the TA button is ON ("TA" is shown on the display), the AF function is OFF and the tape deck or CD is heard, should the TP station become weak, the radio will start BSA (Best TP Station Auto search) 10 seconds after "TP" disappears from the display. The tuner will automatically tune to the strongest TP station in the area, and will stand by for a traffic bulletin. BSA does not work when the AF function is selected, so turn the AF function OFF when you want to use BSA.

> When the AF function is selected, the TP alarm function will work.

Tuning functions on each RDS modes

Tuning Mode	AF Mode	TA Mode & AF plus TA Mode
Seek Tuning will stop to find,	RDS Stations	TP or EON-TP Station
BSM will select and memorize in presets,	RDS Stations	TP Stations

> Non-RDS stations such as those using the Swedish MBS system may be tuned in as RDS stations, but this is due to both systems using the same 57 kHz subcarrier frequency and is not a malfunction of the unit.

Tuning steps while in AF or TA mode

> The tuning step is normally 50 kHz during seek tuning on an FM band. However, this tuning step changes to 100 kHz when the set is in AF or TA mode. In some countries it may be desirable to set a tuning step of 50 kHz in AF mode. (See page 20 for how to switch.)

> During manual tuning, the step does not change; it remains fixed at 50 kHz.

> In AF mode, only those stations being broadcast at 100 kHz steps are subject to AF reception (CENELEC STANDARD).

Audio adjustment

This section explains how to adjust sound quality using the audio unit's DSP function. Set the controls to produce the ideal balance for the vehicle, store the settings in memory and enjoy perfect sound.

> The audio unit functions available, depend on the setup and on which components are installed in the system. Some modes and functions cannot be operated and effects cannot be obtained unless the appropriate components are in place. Become acquainted with the particular system installed in the vehicle before making use of the DSP function to adjust sound.

> Most audio adjustment operations can be conducted while the SYSTEM COMMUNICATOR cover is open.

CONTENTS

- **Audio menu 62**
  - The ODR system audio menu 62
  - Switching the audio menu 63
  - Canceling the audio menu (Return to the operations screen of each source) 63
- **Main menu <MAIN> 64**
  - Switching to the main menu 64
  - Fader/balance adjustment 65
  - Parametric bass/treble adjustment <B/T> 66
  - Adjusting the subwoofer/center speaker <S/C> 68
  - Adjusting the listening position <PS> 71
  - Source level adjuster function <SLA> 76
  - CD noise gate function <N.G> 78
- **Equalizer menu <EQUALIZER> 79**
  - Switching to the equalizer menu 80
  - Relation between frequency characteristics and quality 81
  - Adjusting the 31/16 band graphic equalizer 82
  - Adjusting the 3 band parametric equalizer 85
  - The flat function <FLT>.. 88
- **NAC menu <NAC> 89**
  - What is NAC (Natural Acoustic Control)? 89
  - Switching to the NAC menu 89
  - Using NAC 90
  - Before adjusting parameters 92
  - Adjusting the parameters 94
  - Parameter guide 97
  - Using center image control <IMG> 103
- **Network menu <NETWORK> 104**
  - What is the multi-amp system? 104
  - Switching to the network menu 105
  - Time alignment adjustment 106
  - Filter adjustment 111
- **Memory functions of adjusted audio menu 117**
  - Switching to memory mode 118
  - Storing the adjustment data in memory 119
  - Recalling data stored in memory 120
  - Memory protect function 122
  - Memory clearing operations 123
- **Display for the person who set up the audio adjustments 124**
  - Input characters (Switching to the edit mode) 124

Audio menu

A vehicle, unlike the home audio, imposes several constraints upon the quality of reproduced sound, and have the following effects:

- Reflected sounds have strong effects on direct sounds because of the confined space and complex shape within a vehicle. This disturbs frequency characteristics and significantly reduces sound quality.
- The orientation of the sound image becomes unnatural, because speakers may not be installed symmetrically to left and right of the listener, or because speakers are installed in both the front and rear.

The ODR system is equipped with a wide variety of functions that use DSP to create the ideal sound quality and sound image in a vehicle and overcome these constraints on reverberation.

The ODR system audio menu

This system has the following four audio menus:

Main <MAIN> (page 64)

This carries out fader/balance adjustments as well as bass/treble tone control, the basis for sound quality adjustments. It also sets up and adjusts the position selector, which corrects the orientation of the sound image for the listener's position in the vehicle.

Equalizer <EQUALIZER> (page 79)

This corrects complex frequency disturbance in a vehicle.
The equalizer function for the component set up in Address 1 can make fine adjustments of sound quality for each frequency.

Natural Acoustic Control <NAC> (page 89)

This creates a natural sound field. It also enhances reality and the power of vocal sounds by introducing several echo conditions. This permits fine control of the sound field in a vehicle.

> This function works when RS-P50 is connected and set up in NAC mode or RS-P1.

Network <NETWORK> (page 104)

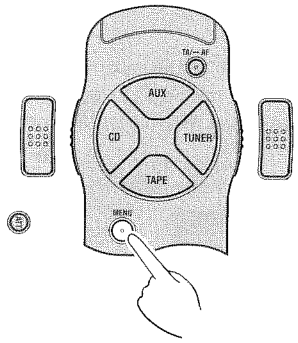
This adjusts the reproduced frequency band (cross-over frequency) and the level of each sound range (band) when a multi-amp system is set up. It also corrects unnatural orientation of the sound image caused by the locations of the speakers (using the time alignment function), by setting up a delay (time difference) between speakers set up for different sound ranges.

> This does not function when the system is used on network THRU (through) mode when the system only comprises digital amp [RS-A1 and RS-A2].

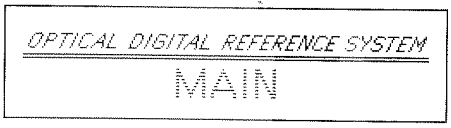
Switching the audio menu

When the system is ON, the audio menu can be switched using the following procedure.

Press the MENU button to switch audio menus in the following sequence.



Example:
Main menu title screen



OPTICAL DIGITAL REFERENCE SYSTEM
MAIN

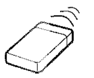
The screen switches to the adjustment screen after a few seconds.

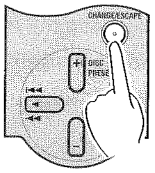
MAIN → EQUALIZER → NAC → NETWORK → MAIN

Canceling the audio menu (Returning to the operations screen of each source)

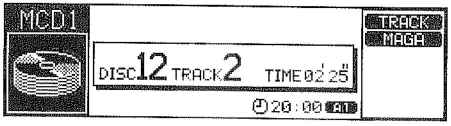
Press the CHANGE/ESCAPE button to cancel the audio menu.

Cancel the audio menu to return to the operations screen of the source currently in use.





Example:
A1: Multi-CD operation screen (closed state)



MCD1
TRACK
MAGA
DISC12 TRACK2 TIME02'25"
20:00 A1

The unit does not switch to the menu of a component that is not installed

> When RS-P1 is not connected or RS-P50 in NAC mode is not connected, the unit does not switch to the NAC menu.

> When a system comprising only RS-A1 and RS-A2 is used in network THRU mode, the unit does not switch to the network menu.

> See page 127 and the manual for the audio unit for the setup of each audio unit mode.

Another way to cancel the audio menu

> Switch to each source to cancel the audio menu.

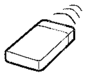
Main menu <MAIN>

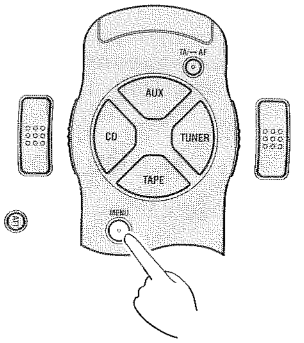
Switching to the main menu

Press the MENU button to switch to the main menu.

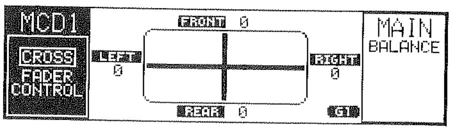
(see page 63.)

After the title screen, the display switches to the operations screen of the main menu. Opening and closing the cover of the SYSTEM COMMUNICATOR switches between the open and closed states of the menu display and adjustment screen.

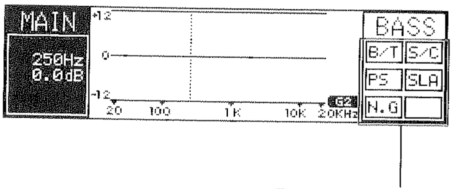



TA/— AF
AUX
CD
TUNER
TAPE
MENU

Closed state
G1: Fader/balance adjustment screen


MCD1
CROSS
FADER CONTROL
FRONT 0
LEFT 0
RIGHT 0
REAR 0
G1
MAIN
BALANCE

Open State
Example: G2: Bass/treble adjustment screen


MAIN
250Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
G2
BASS
B/T
S/C
PS
SLA
N.G

Function buttons display

❖ Operating the main menu

The following 6 adjustments may be made using the main menu.

Fader/balance adjustment (closed state) (page 65)

Parametric bass/treble adjustment <B/T> (page 66)

Subwoofer/center speaker adjustment <S/C> (page 68)

Listening position adjustment <PS> (page 71)

Source level adjuster <SLA> (page 76)

CD noise gate <N.G> (page 78)

Canceling the main menu

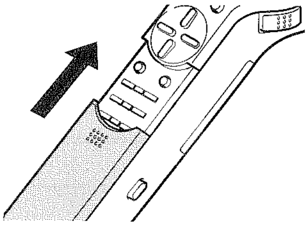
> Press the CHANGE/ESCAPE button to cancel the main menu (see page 63, "Canceling the audio menu").

Fader/balance adjustment (closed state) G1

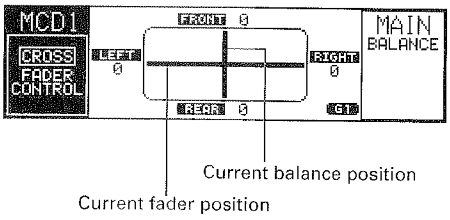
Fader (sound volume balance between the front and rear speakers) and balance (sound volume balance between the left and right speakers) are adjusted with the SYSTEM COMMUNICATOR cover closed.

1. **Close the cover of the SYSTEM COMMUNICATOR.**

   The display switches to G1: fader/balance adjustment screen.

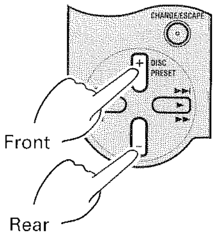


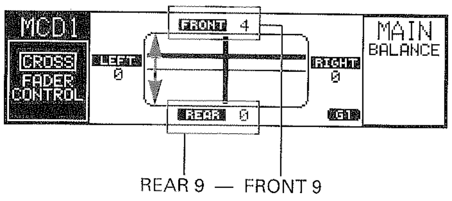
G1: Fader/balance adjustment screen


MCD1
CROSS
FADER CONTROL
FRONT 0
LEFT 0
RIGHT 0
REAR 0
G1
MAIN BALANCE
Current balance position
Current fader position

2. **Press the +/– buttons to adjust the fader.**

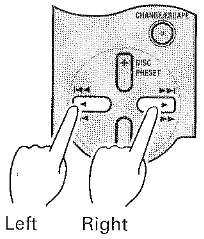
   Holding down these buttons continues their operations (with one stop at the central position).

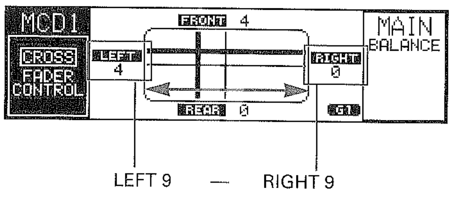

CHANGE/ESCAPE
DISC PRESET
Front
Rear


MCD1
CROSS
FADER CONTROL
FRONT 4
LEFT 0
RIGHT 0
REAR 0
G1
MAIN BALANCE
REAR 9 — FRONT 9

3. **Press the ◀ ▶ buttons to adjust the balance.**

   Holding down these buttons continues their operations (with one stop at the central position).


CHANGE/ESCAPE
DISC PRESET
Left
Right


MCD1
CROSS
FADER CONTROL
FRONT 4
LEFT 4
RIGHT 0
REAR 0
G1
MAIN BALANCE
LEFT 9 — RIGHT 9

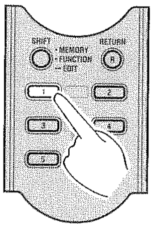
Parametric bass/treble adjustment <B/T>

It is possible to select one from a choice of four frequencies to becomes the reference when adjusting the bass/treble tone. The frequencies and level adjustment ranges from which selections may be made are as follows:

Bass : 63 Hz, 100 Hz, 160 Hz, 250 Hz
Treble: 4 kHz, 6.3 kHz, 10 kHz, 16 kHz
Level adjustment range: –12 dB — +12 dB (1 dB/1 step)

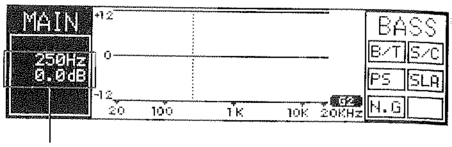
1. **Press Function button/1.**

The display switches to G2: bass/treble adjustment screen.



SHIFT
RETURN
• MEMORY
• FUNCTION
— EDIT
1
2
3
4
5

G2: Bass/treble adjustment screen

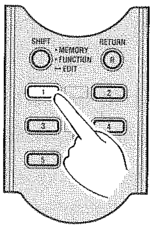


MAIN
250Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
G2
BASS
B/T
S/C
PS
SLA
N.G

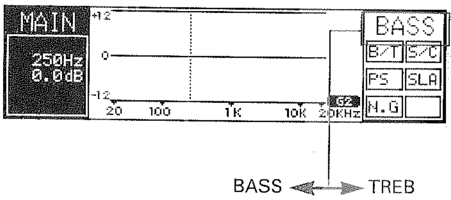
The current setting is displayed.

2. **Press Function button/1 again to choose bass or treble.**

Press the button to switch between bass and treble.



SHIFT
RETURN
• MEMORY
• FUNCTION
— EDIT
1
2
3
4
5

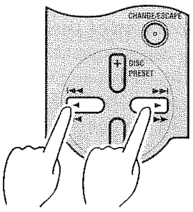


MAIN
250Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
G2
BASS
B/T
S/C
PS
SLA
N.G

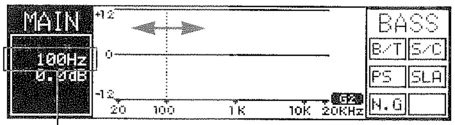
BASS ⟷ TREB
Bass Treble

3. Press the ◀ ▶ buttons to select a frequency point.

Tune to the desired frequency point.


CHANGE/ESCAPE
DISC
PRESET

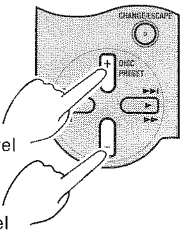
To a lower frequency To a higher frequency


MAIN
100Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
G2
BASS
B/T
S/C
PS
SLA
N.G

Bass : 63 Hz, 100 Hz, 160 Hz, 250 Hz
Treble: 4 kHz, 6.3 kHz, 10 kHz, 16 kHz

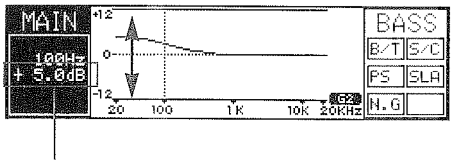
4. Press the +/– buttons to adjust the level.

Holding down these buttons continues their operations (with one stop at the central position).


CHANGE/ESCAPE
DISC
PRESET

To a higher level

To a lower level


MAIN
100Hz
+ 5.0dB
+12
0
-12
20
100
1K
10K
20KHz
G2
BASS
B/T
S/C
PS
SLA
N.G

–12.0 dB — +12.0 dB
Min. Max.

Adjusting the subwoofer/center speaker <S/C>

When the subwoofer and center speaker are connected, the frequency bands recreated by each speaker can be adjusted with their recreation level. Adjust the bands to match the characteristics and functions of the speakers.

> When using a system without a subwoofer or center speaker, the unit will not switch to the subwoofer or center speaker adjustment mode. (When an output terminal for subwoofer or center speaker is in the audio unit, as in the case of the RS-P1 center speaker output terminal, the unit will switch to adjustment mode, even when the speaker is not connected.)

❖ Simple tuning of the subwoofer

Adjust the cut-off frequencies of the subwoofer's low pass filter (L.P.F.) and reproducing levels of the subwoofer.

L.P.F. cut-off frequencies: 25 Hz — 250 Hz (Every 1/3 octave, total 11 steps)

This cuts off the upper range (treble) from the adjusted frequency to recreate bass.

Level tuning range: -24.0 dB — +10.0 dB (0.5 dB/1 step)

> The high pass filter (H.P.F.) frequency is fixed during simple tuning of the subwoofer. The L.P.F. frequency cannot be tuned below the current frequency of the H.P.F. (Frequency of the H.P.F. can be adjusted in network menu on page 104.)

❖ Tuning of the center speaker

Adjust the cut-off frequencies of the center speaker's high pass filter (H.P.F.) and reproducing levels of the center speaker.

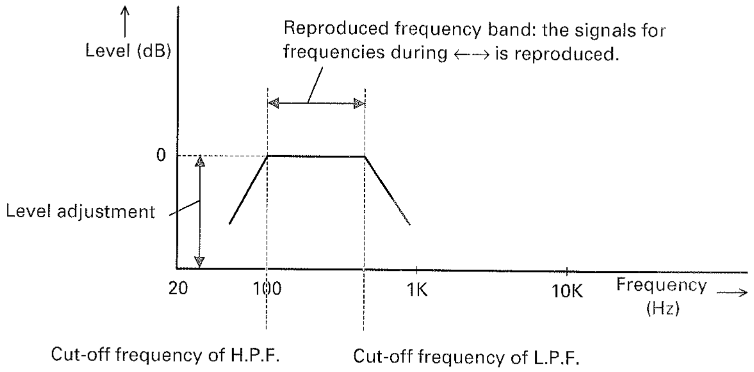
H.P.F. cut-off frequencies: 100 Hz — 10 kHz (Every 1/3 octave, total 21 steps)

This cuts off the lower range (bass) from the adjusted frequency to recreate mid-high.

Level tuning range : - ∞, -24.0 dB — 0 dB (0.5 dB/1 step)

> The difference between H.P.F. and L.P.F. frequencies does not change while adjusting the center speaker. Adjusting the H.P.F. frequency automatically changes the L.P.F. frequency.

> Setting the H.P.F. frequency at frequencies higher than 3.15 kHz sets the L.P.F. at PASS, thereby losing the L.P.F. effects. [L.P.F. frequency: 630 Hz — PASS (Every 1/3 octave, total 16 steps)]

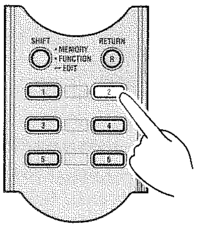

Level (dB)
Reproduced frequency band: the signals for frequencies during ←→ is reproduced.
0
Level adjustment
20
100
1K
10K
Frequency →
(Hz)
Cut-off frequency of H.P.F.
Cut-off frequency of L.P.F.

The subwoofer can be fine tuned

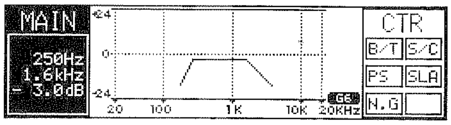
> Using the network menu enables fine tuning, including tuning of the H.P.F. and switching phases, as well as the subwoofer reproduction level and L.P.F. frequency. (See page 104.)

❖ Tuning G7 / G6

1. **Press Function button/2 to switch to the subwoofer/center speaker tuning mode.**

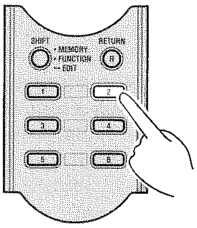

SHIFT
• MEMORY
• FUNCTION
– EDIT
RETURN
R
1
2
3
4
5
6

Example:
G6: Center speaker tuning screen

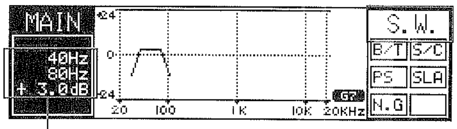

MAIN
250Hz
1.6kHz
- 3.0dB
+24
0
-24
20
100
1K
10K
20KHz
G6
CTR
B/T
S/C
PS
SLA
N.G

2. **Press Function button/2 again to select simple subwoofer tuning or center speaker tuning.**

   Press the button to switch between G7: simple subwoofer tuning screen, and G6: center speaker tuning screen.


SHIFT
• MEMORY
• FUNCTION
– EDIT
RETURN
R
1
2
3
4
5
6

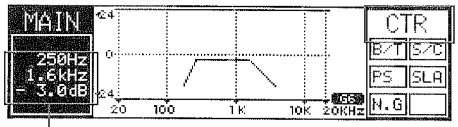
G7: Simple subwoofer tuning screen


MAIN
40Hz
80Hz
+ 3.0dB
+24
0
-24
20
100
1K
10K
20KHz
G7
S.W.
B/T
S/C
PS
SLA
N.G

The current setting is displayed.

↕

G6: Center speaker tuning screen

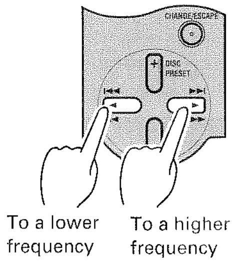

MAIN
250Hz
1.6kHz
- 3.0dB
+24
0
-24
20
100
1K
10K
20KHz
G6
CTR
B/T
S/C
PS
SLA
N.G

The current setting is displayed.

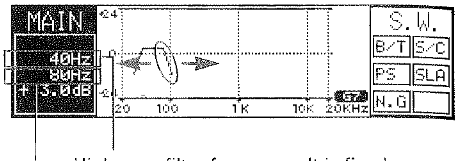
Continued overleaf.

3. Press the ◀ ▶ buttons to tune filter frequencies.

Holding down these buttons continues their operations.


CHANGE/ESCAPE
DISC
PRESET
To a lower frequency
To a higher frequency

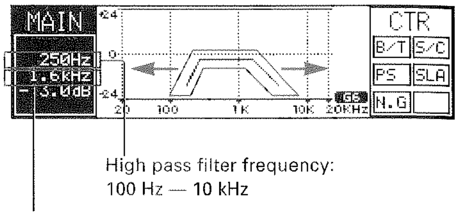
For simple subwoofer tuning


MAIN
40Hz
80Hz
+ 3.0dB
S.W.
B/T
S/C
PS
SLA
N.G
G7
20
100
1K
10K
20KHz

High pass filter frequency: It is fixed.

Low pass filter frequency: 25 Hz — 250 Hz

For center speaker tuning

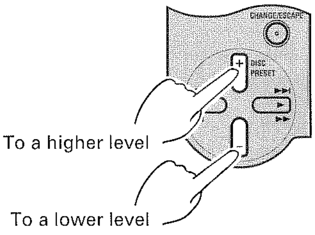

MAIN
250Hz
1.6kHz
- 3.0dB
CTR
B/T
S/C
PS
SLA
N.G
G6
20
100
1K
10K
20KHz

High pass filter frequency:
100 Hz — 10 kHz

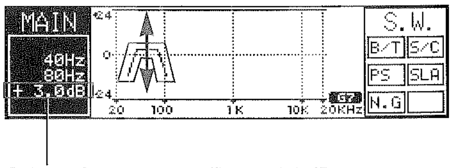
Low pass filter frequency:
Tuned automatically in line with the high pass filter.
(630 Hz — PASS)

4. Press the +/– buttons to adjust the level.

Holding down these buttons continues their operations.


CHANGE/ESCAPE
DISC
PRESET
To a higher level
To a lower level

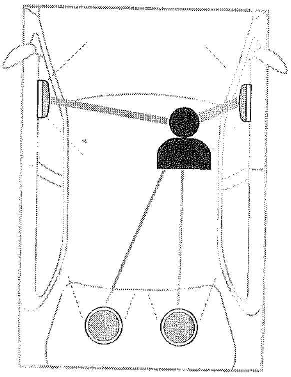
Example:
G7: Simple subwoofer tuning screen


MAIN
40Hz
80Hz
+ 3.0dB
S.W.
B/T
S/C
PS
SLA
N.G
G7
20
100
1K
10K
20KHz

Subwoofer : -24.0 dB — +10.0 dB
Center speaker : -24.0 dB — 0 dB

Adjusting the listening position <PS>

Ascertaining the orientation of the sound image by listening at the center of the sound field is one way to hear sounds more naturally. Placing speakers in front and listening to the sound from a position equidistant from them is common practice with home audio equipment.
However, the distances between the listener and the front, rear, left and right speakers are different in a vehicle. The orientation of the sound image becomes unnatural because of differences in the time taken for sounds from each speaker to reach the listener, as well as differences in the levels of these sounds. (For example, the direction from which vocals appear to be coming may be unclear.)



The ODR system can correct the sound image to a more natural one as follows:

Position selector function

This function appropriately adjusts the orientation of the sound image to suit the listener's position in the vehicle.

- It is possible to set up delays for the front, rear, left and right speakers. (Time differences between speakers are corrected by delaying input signals to closer speakers.)
- This feature positions the sound image in front by setting up differences in level between the speakers.

Position fine tuning function

In addition to the position selector function, the delay time and the difference in the sound levels can be finely tuned to match the location of the speakers and the shape of the car interior.

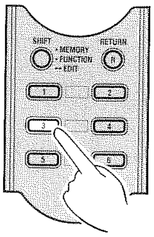
To derive maximum benefit from the position fine tuning function

> Adjustments to the delays of the position fine tuning function are closely related to the time alignment function (page 106) on the network menu, which sets up delays for speakers for each sound frequency range (band). When a multi-amp system is in use, refer to "Effective delay time adjustment using the position fine tuning function" (page 75).

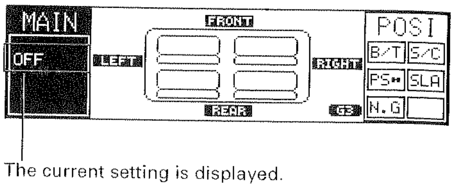
❖ Using the position selector

1. **Press Function button/3 to switch to the position selector mode.**

   The display switches to G3: position selector screen.


SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT
1
2
3
4
5
6

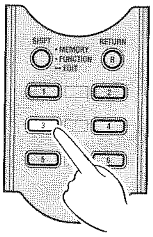
G3: Position selector screen

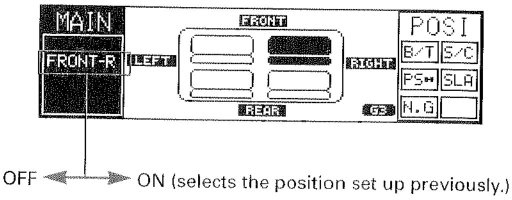

MAIN
OFF
FRONT
LEFT
RIGHT
REAR
G3
POSI
B/T
S/C
PS••
SLA
N.G

The current setting is displayed.

2. **Press Function button/3 again to turn the position selector function ON.**

   Pressing the button switches the function ON/OFF.

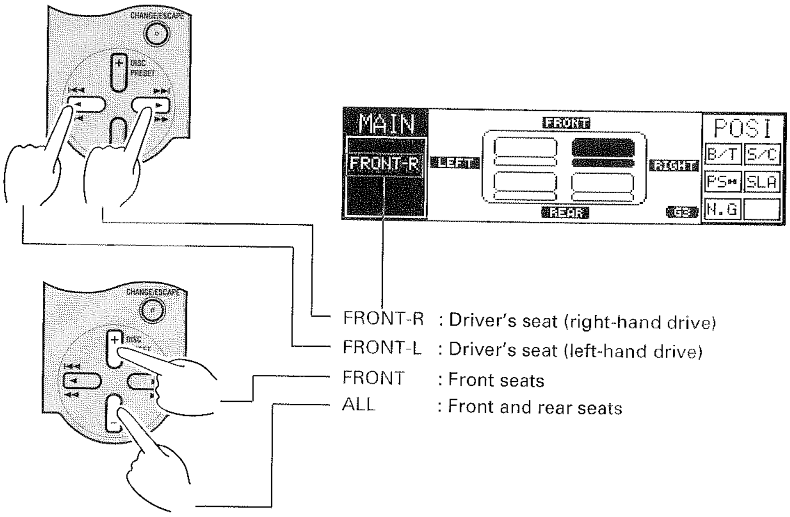

SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT
1
2
3
4
5
6


MAIN
FRONT-R
FRONT
LEFT
RIGHT
REAR
G3
POSI
B/T
S/C
PS••
SLA
N.G

OFF ◄——► ON (selects the position set up previously.)

3. **Press the ◄ ► and +/– buttons to select the position.**

   Set up the position to match the position of the listener in the car.


CHANGE/ESCAPE
DISC
PRESET
MAIN
FRONT-R
FRONT
LEFT
RIGHT
REAR
G3
POSI
B/T
S/C
PS••
SLA
N.G

FRONT-R : Driver's seat (right-hand drive)
FRONT-L : Driver's seat (left-hand drive)
FRONT : Front seats
ALL : Front and rear seats

Experimenting with other positions

> The position is normally designed to match the listener's position in the car. However, other positions may prove to be more effective, depending on the model of the car and the location of the speakers. Compare the sound and choose the position in which the sounds are most natural.

❖ Fine tuning the position

After choosing the position using the position selector function, it is possible to fine tune the delay time and the difference in sound levels. Conduct the fine tuning to match the location of the front, rear, left and right speakers and the shape of the car and correct the position of the sound image so that the sounds are most natural.

Delay time: 0 — 10 msec. (0.05 msec./1 step)

The greater the delay time value, the longer the sounds coming from the speaker take to reach the ears of the listener, giving the listener the feeling that the speaker is moving further away. The sound image thus moves in the direction in which the value for the delay time is closer to 0.

Adjustment range in the difference in sound levels: 0 dB — -30 dB (1 dB/1 step)

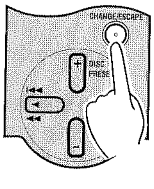
The smaller the level, the lower the sound volume output from the speaker, giving the listener the feeling that the speaker is moving further away. The sound image thus moves in the direction in which the value for the difference in sound levels is closer to 0.

> Fine tuning can be conducted separately for each position.

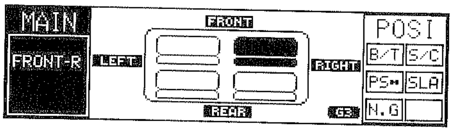
> The values set after fine tuning are stored into memory as the values for the position. When the position is next called up, the fine tuning values are recalled.

1. Use the position selector function to select the position.

(See the previous page.)

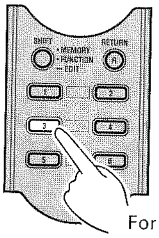

CHANGE/ESCAPE
DISC
PRESET

Example: When selecting FRONT-R


MAIN
FRONT-R
FRONT
LEFT
RIGHT
REAR
G3
POSI
B/T
S/C
PS••
SLA
N.G

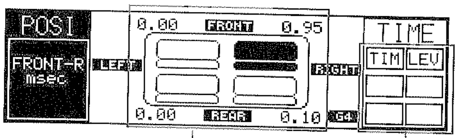
2. Hold down Function button/3 for at least 2 seconds to switch to fine tuning mode.

The display switches to G4: position fine tuning screen.


SHIFT
•MEMORY
•FUNCTION
—EDIT
RETURN
1
2
3
4
5
6

For at least 2 seconds

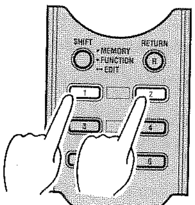
G4: Position fine tuning screen


POSI
FRONT-R
msec
0.00
FRONT
0.95
LEFT
RIGHT
0.00
REAR
0.10
G4
TIME
TIM
LEV

The current setting is displayed.

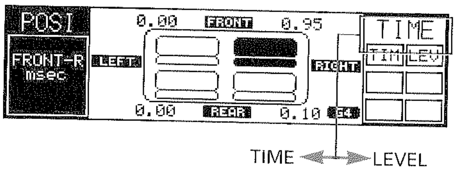
Function buttons display

3. Press Function buttons/1 or 2 to select the delay time adjustment or difference in sound levels adjustment.


SHIFT
•MEMORY
•FUNCTION
—EDIT
RETURN
1
2
3
4
5
6

Delay time

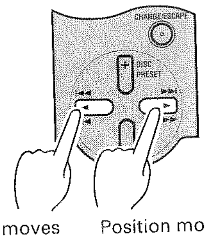
Difference in sound levels

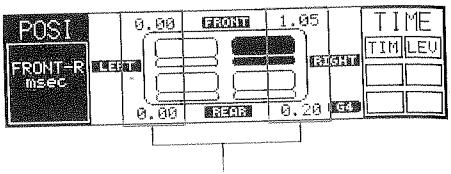

POSI
FRONT-R
msec
0.00
FRONT
0.95
LEFT
RIGHT
0.00
REAR
0.10
G4
TIME
TIM
LEV
TIME
LEVEL

Continued overleaf.

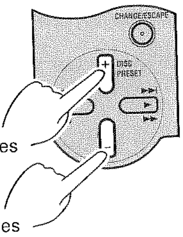
4. **Press the ◀ ▶ and +/– buttons to correct the position of the sound image.**

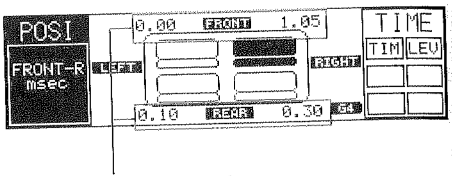
   Holding down these buttons continues their operations (during delay time tuning, holding down the button moves the delay time 0.1 msec./1 step).


CHANGE/ESCAPE
DISC PRESET
Position moves to the left
Position moves to the right


POSI
FRONT-R
msec
0.00
FRONT
1.05
LEFT
RIGHT
0.00
REAR
0.20
G4
TIME
TIM
LEV

Delay time: 0 — 10 msec.
Difference in sound levels: 0 dB — -30 dB

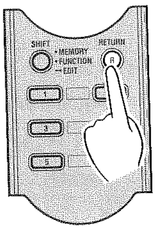

CHANGE/ESCAPE
DISC PRESET
Position moves to the front
Position moves to the rear


POSI
FRONT-R
msec
0.00
FRONT
1.05
LEFT
RIGHT
0.10
REAR
0.30
G4
TIME
TIM
LEV

Delay time: 0 — 10 msec.
Difference in sound levels: 0 dB — -30 dB

5. **After tuning has been completed, press the RETURN button to cancel the fine tuning mode.**

   The values are stored in memory and the display returns to G3: position selector screen.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN

Points concerning fine tuning

> While listening to vocals, adjust the delay to position the vocal sound image naturally to the front.

> Initial setup values for the position selector are included for reference during fine tuning. Please consult these (page 159).

Subwoofer fine tuning

> The position fine tuning function is not operative for the subwoofer.

Center speaker fine tuning

> When fine tuning the difference in level, the media value of the adjusted value of the front left and right speakers is set up. Adjustments to the delay cannot be made.

Connecting other audio units to the optical output of RS-P50 set up in NAC mode

> When RS-P50 is set up in NAC mode and the system includes an additional digital equalizer or digital amplifier receiving optical output, carry out pos tion fine tuning in the following manner:

- Set the rear to the maximum (10 msec.) delay time adjustment.
- Correct the orientation of the sound image by adjusting the difference in level.

❖ Effective delay time adjustment using the position fine tuning function

— Relation to time alignment function —

When the system comprises a multi-amp system, the speaker's delay time can be tuned using either of two methods.

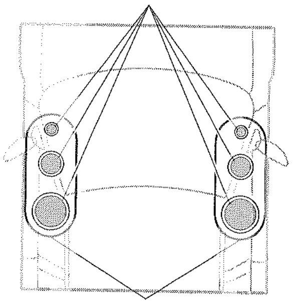
Time alignment function of the network menu (page 106)

The delay time of each band (high, mid, low, subwoofer and center speaker) can be adjusted for the front, rear, left and right speakers.

Delay time tuning of the position fine tuning function

The delay time of the front, rear, left and right speakers can be tuned, regardless of the band. The same tuning is conducted for high, mid and low range bands.

> The position fine tuning function is unable to adjust delay time for the subwoofer or center speaker.



Time alignment function
This function adjusts the delay time of each speaker.

Position fine tuning function
This function adjusts the delay time and the level of the front, rear, left and right speakers.

With a multi-amp system, combine the two methods to ensure the position of the sound images are set up more effectively.

1. **Adjust the delay time for each speaker using the time alignment function of the network menu.**

   (see page 106.)

2. **Adjust the overall delay time of the front, rear, left and right speakers using the position fine tuning function.**

   Use the set values for the time alignment function to fine tune the overall balance of the sound image positions.

3. **Use the position fine tuning function to adjust the overall level balance between the front, rear, left and right speakers.**

   Adjust the difference in sound levels between the front, rear, left and right speakers so that the sound image is in the front.

Adjusting delay using the position fine tuning function

> When the display has switched to K4: time alignment adjustment screen after adjusting delay time using the position fine tuning function, the values set using the position fine tuning function will be added to the values created using the time alignment function and the sum of the values displayed.

> To store the displayed values in memory as new values for the time alignment function (standard values for the position fine tuning function), adjust any one value again, using the +/– buttons. The displayed values will be stored in memory and the delay time set using the position fine tuning function will be reset and returned to 0.

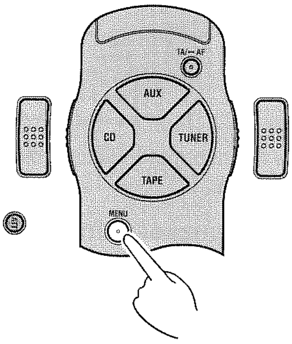
When the delay time has been reset using the time alignment function:

> The delay time of the position fine tuning function uses the delay time of the time alignment function as its basis. If the delay is reset using the time alignment function, this standard value is changed. When this happens, any delay time previously set using the position fine tuning function is reset to 0.

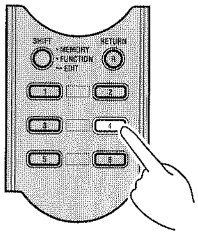
Source level adjuster function <SLA>

Have you ever experienced sudden increases in the sound volume after switching to CD playback during an FM broadcast? This is caused by the difference between the CD recording level and the FM output level.
This unit can pre-adjust differences in sound volume caused by switching sources (CD, tape, AM (MW/LW), AUX), using the FM sound volume as the standard volume.

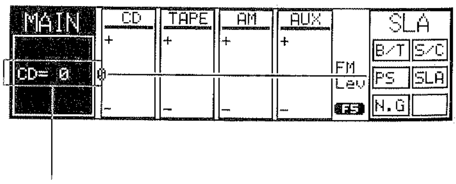
1. **Switch to an FM broadcast and check the FM sound volume.**
   (See page 26.)
2. **Switch to CD playback.**
   (See page 26.)
   Confirm the difference in sound volume after switching to CD playback.
3. **Press the MENU button to switch to the main menu.**
   Open the cover of the SYSTEM COMMUNICATOR to change the menu display to open state.


TA/–AF
AUX
CD
TUNER
TAPE
MENU

4. **Press Function button/4 to switch to SLA mode.**
   The display switches to G5: SLA adjustment screen.


SHIFT
• MEMORY
• FUNCTION
• EDIT
RETURN
1
2
3
4
5
6

G5: SLA adjustment screen

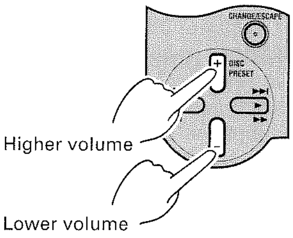

MAIN
CD= 0
0
CD
TAPE
AM
AUX
+
–
FM
Lev
FS
SLA
B/T
S/C
PS
SLA
N.G

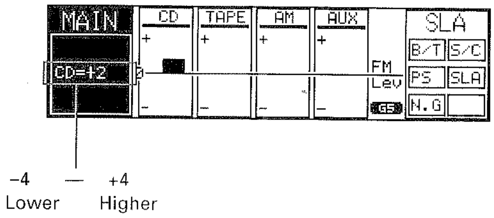
The current level is displayed.

5. Press the +/– buttons to adjust the output level.

Adjust the sound volume of the CD to match the FM sound volume.

> The output level of the source currently being listened to can be adjusted.


CHANGE/ESCAPE
DISC
PRESET
+
–
Higher volume
Lower volume


MAIN
CD=+2
CD
TAPE
AM
AUX
+
–
FM
Lev
G5
SLA
B/T
S/C
PS
SLA
N.G
–4
—
+4
Lower
Higher

6. Making the adjustment with other sources.

Switch to other sources (Tape, AM (MW/LW), AUX) and repeat operations 3 — 5.

The FM output level cannot be adjusted

> As the FM sound volume is used as the standard volume, the FM output level cannot be adjusted.

About the CD output level

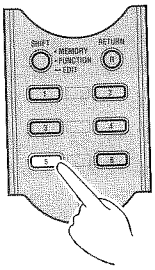
> When both a multi-CD player and single-CD player [RS-D2] are connected, their output levels will be the same.

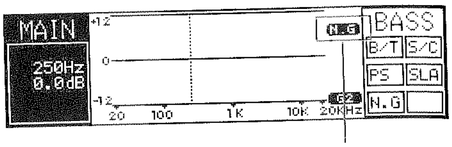
CD noise gate function <N.G>

If the current status prevents signals from being recorded by the CD while it is playing, this function reduces noise from the entire system by applying the mute to the output.

> The CD noise gate function can be only turned ON/OFF during CD playback.

Press Function button/5 to turn the CD noise gate function ON/OFF.


SHIFT
• MEMORY
• FUNCTION
— EDIT
RETURN
R
1
2
3
4
5
6


MAIN
250Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
N.G
G2
BASS
B/T
S/C
PS
SLA
N.G

"N.G" is displayed when the function is ON.

> When the noise gate is on, "N.G" is displayed on the CD operations screen.

Equalizer menu <EQUALIZER>

One important factor for creating quality sound is the correction of disturbances in frequency characteristics within the complex shape of a vehicle interior. Reflected sounds have a strong effect on direct sound in a vehicle because of the vehicle's shape, the confined space, absorption of sound by the seats and reflection from the windows. All these cause disturbances in the frequency characteristics. Such disturbances will be apparent as reduced sound quality.

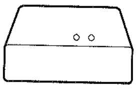
Any one of three kinds of digital equalizer is used under the ODR system, depending upon the configuration of the audio system. The digital equalizer adjustment corrects disturbances in frequency characteristics and creates a smooth sound quality.

> As installation conditions differ for the front and rear speakers, different corrections must be made for each. All three digital equalizers are able to correct the front and rear speakers separately.

> The equalizer functions of the unit set up in Address 1 of the audio unit can be used.

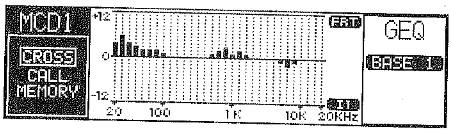
❖ 31 Band Graphic Equalizer (31B-GEQ)

— When RS-P1 is set up in Address 1 —



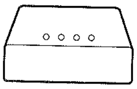
[RS-P1]

The level can be adjusted in 31 bands (every 1/3 octave), for both the front and rear speakers. This allows fine tuning of the sound fields to the desired position.



❖ 16 Band Graphic Equalizer (16B-GEQ)

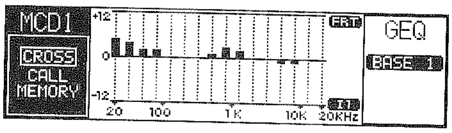
— When RS-P50 is set up in Address 1 —



[RS-P50]

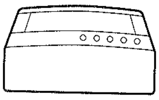
The level can be adjusted in 16 bands (every 2/3 octaves), for both the front and rear speakers. This enables the sound field to be corrected to create the ideal sound characteristics in the car.

> When an RS-P1 is included in the system, the 16 band graphic equalizer does not operate.



❖ 3 Band Parametric Equalizer (3B-PEQ)

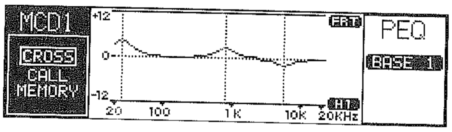
— When the system has only RS-A1/RS-A2 —



[RS-A1] [RS-A2]

The level can be adjusted in 3 bands, for both the front and rear speakers. Select the frequency which serves as a point in level adjustment from among the 31 frequencies (every 1/3 octave) when adjustment is required. The inclination of equalizer curve (Q factor) in each band can also be adjusted.

> When RS-P1 or RS-P50 is included in the system, the 3 band parametric equalizer does not operate.

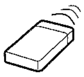


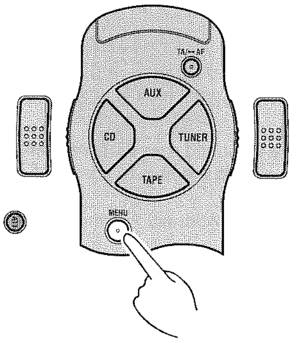
Switching to the equalizer menu

I1 / **I2** (GEQ)
H1 / **H2** (PEQ)

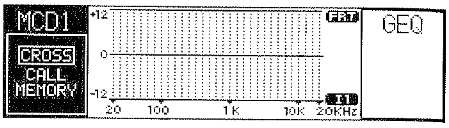
Press the MENU button to switch to the equalizer menu.
(See page 63.)

After the title screen, the display switches to the operations screen of the equalizer menu. Opening and closing the cover of the SYSTEM COMMUNICATOR switches between the open and closed states of the menu display.

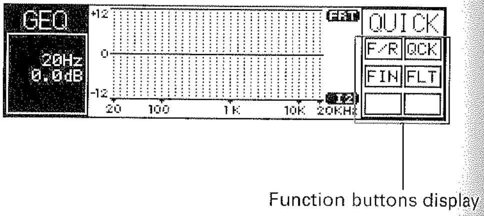



TA/⇔AF
AUX
CD
TUNER
TAPE
MENU

Closed state
I1/H1: Equalizer basic screen (Example: 31B-GEQ)


MCD1
CROSS
CALL
MEMORY
+12
0
-12
20
100
1K
10K
20KHz
FRT
I1
GEQ

Open state
I2/H2: Equalizer adjustment screen (Example: 31B-GEQ)


GEQ
20Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
FRT
I2
QUICK
F/R
QCK
FIN
FLT
Function buttons display

❖ Operating the equalizer menu

Adjusting the 31/16 band graphic equalizer (Page 82)

Adjusting the 3 band parametric equalizer (Page 85)

Memory functions of equalizer curve (Page 117)

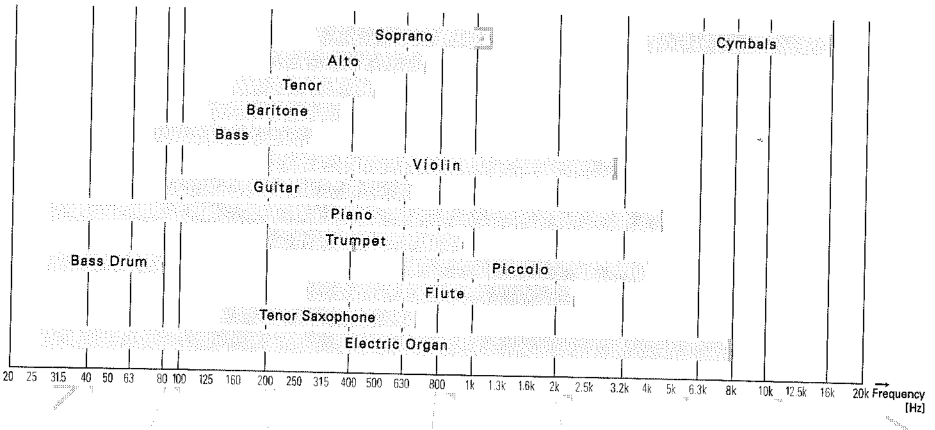
Up to 5 adjusted equalizer curves can be stored in memory. The stored memory can be easily recalled or cleared (returning the status to its original flat state).

Canceling the equalizer menu

> Press the CHANGE/ESCAPE button to cancel the equalizer menu (see Page 63 "canceling the audio menu").

Relation between frequency characteristics and sound quality

Sound quality generally has the following characteristics, depending on the frequency. Refer to these characteristics when making adjustments.



This sound range feels almost like pressure on the ears of the listener, particularly if the sound is too strong.

In this range, the listener feels the heavy bass. This is also the range in which the impact of the sound is felt in the body. Excessive sound in this range will impair the clarity of the overall sound.

The sound range required for bass. A lack of sound in this range results in a weak bass impact, while excessive sound will muffle the overall sound. A clear reproduction lends depth to the overall sound.

This is the sound range in which the sound signals are most dense and where the sound outline is created. A lack of sound in this range results in a lack of warmth. Excessive sound dims clarity.

The sound range required for the core of the sound. A lack of sound in this range weakens the core. An important range for keeping the overall sound quality in balance.

In this range, the sharp, expansive sounds of the brass and electric guitar are felt. However, excessive sound in this range is tiring on the ears.

This sound range adds color and gaiety to the overall sound. A lack in sound in this range will result in a muffled overall sound, while excessive sound will enhance the metallic aspects.

This range is required for the glamorous sound of the cymbals. However, this range does not contain the basic frequencies of almost all the instruments. Therefore, if the sound in this range is lacking somewhat, the overall sound quality will not deteriorate markedly.

The points when adjusting the equalizer curve

> Take the recreated frequency bands of the speakers into consideration when adjusting. For example, when a speaker with a band between 80 Hz — 4 kHz is connected, adjusting the level in 50 Hz or 10 kHz will have no effect.

> Balancing the bass and treble is recommended. The bass tends to be lacking when no subwoofer is connected. Adjust the treble to a lower volume to match the weaker bass and create a well-balanced sound.

> Noises coming from the road make the bass seem weak while driving. If the level is below 100 Hz, adjust to a slightly greater level to maintain superb sound balance while driving.

> When the sound is inadequate or excessive, it is recommended to set the levels after checking the frequencies of the sounds in question by changing the peripheral frequencies to the maximum or minimum.

12 Adjusting the 31/16 band graphic equalizer

> While this manual uses an illustration of a 31 band graphic equalizer screen for explanation, the procedures for adjusting a 16 band graphic equalizer are identical.

❖ About the methods to adjust the graphic equalizer

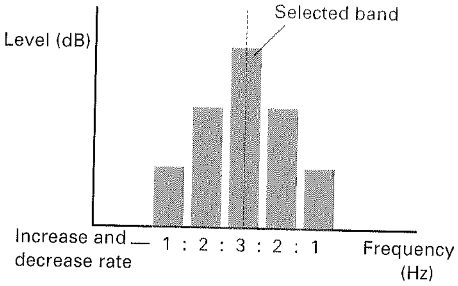
The graphic equalizer can be adjusted using two methods.

Quick adjustment <QCK>

The bands located on either side of the selected band (frequency) can be adjusted simultaneously.

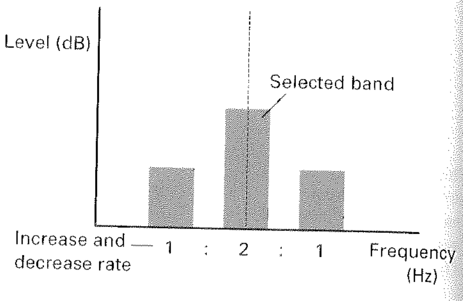
It is possible to quickly adjust bands to a superb balance without impairing the natural sound field.

With a 31B-GEQ



The bands located on either sides of the selected band can be adjusted simultaneously (a total of 5 bands can be adjusted simultaneously.)
When the selected band is increased or decreased by 3.0 dB, the neighboring bands will increase or decrease by 2.0 dB, while the bands neighboring them will increase or decrease by 1.0 dB.

With a 16B-GEQ



One band each located on either side of the selected band can be adjusted simultaneously (a total of 3 bands can be adjusted simultaneously.)
Increasing or decreasing the selected band by 2.0 dB will increase or decrease the neighboring bands by 1.0 dB.

Fine tuning <FIN>

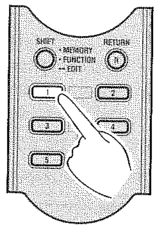
The fine tuning function adjusts the selected band (frequency) only. This function increases or decreases the level by 1 band, allowing the listener to create the optimum sound field.

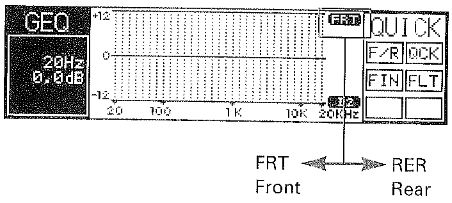
❖ Setting the equalizer curve

Adjustable frequency
(31B-GEQ): 20 Hz — 20 kHz (Every 1/3 octaves, total 31 bands)
(16B-GEQ): 20 Hz — 20 kHz (Every 2/3 octaves, total 16 bands)

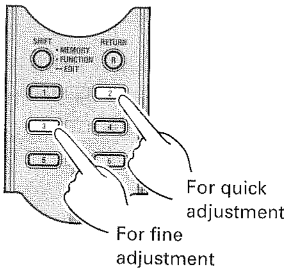
Level adjustment range: –12 dB — +12 dB (1 dB/1 step)

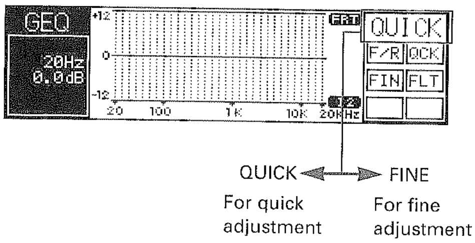
1. **Press Function button/1 to select front or rear.**
   Press the button to switch between front and rear.


SHIFT
RETURN
MEMORY
FUNCTION
EDIT
1
2
3
4
5

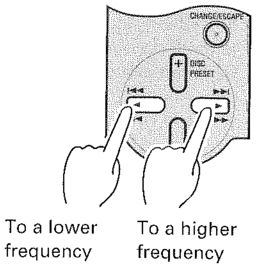

GEQ
20Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
FRT
12
QUICK
F/R
QCK
FIN
FLT
FRT
Front
RER
Rear

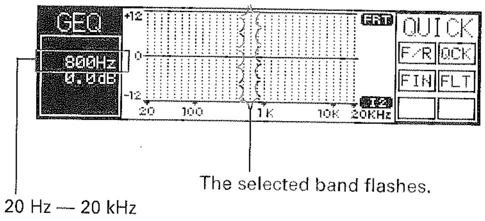
2. **Press Function button/2 or 3 to select quick adjustment or fine adjustment.**
   Press Function button/2 for quick adjustment.
   Press Function button/3 for fine adjustment.


SHIFT
RETURN
MEMORY
FUNCTION
EDIT
For quick adjustment
For fine adjustment


GEQ
20Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
FRT
12
QUICK
F/R
QCK
FIN
FLT
QUICK
For quick adjustment
FINE
For fine adjustment

3. **Press the ◀ ▶ buttons to adjust to the desired band (frequency).**
   Holding down these buttons continues their operations.


CHANGE/ESCAPE
DISC
PRESET
To a lower frequency
To a higher frequency

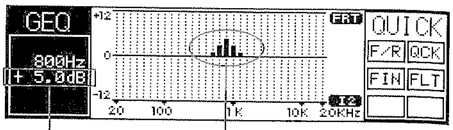

GEQ
800Hz
0.0dB
+12
0
-12
20
100
1K
10K
20KHz
FRT
12
QUICK
F/R
QCK
FIN
FLT
The selected band flashes.
20 Hz — 20 kHz

Continued overleaf.

4. Press the +/– buttons to adjust the level.

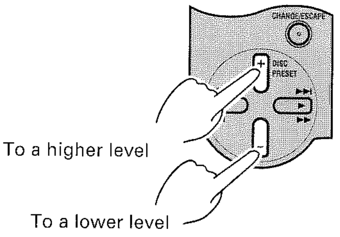
Holding down these buttons continues their operations. (In the case of fine tuning, it stops once at level 0 dB.)

For quick adjustment mode

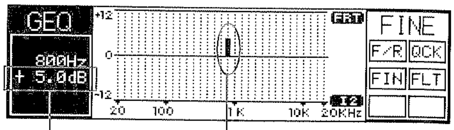


–12.0 dB — +12.0 dB

The degree of adjustment of the selected band determines the degrees of adjustment of the two bands on either side.



For fine adjustment mode



–12.0 dB — +12.0 dB

The level of the selected band only is adjusted.

5. Adjust the other bands.

Repeat steps 3 and 4 to adjust to the desired sound.

6. Switch between front and rear to set up the equalizer curve.

Repeat steps 1 — 5 to set up equalizer curves for the front and rear speakers separately.

Quick and fine adjustments can be conducted while switching between them

> Carrying out step 2 when selecting other bands enables adjustment while switching between quick and fine adjustments.

> In the quick adjustment, the selected band cannot be adjusted further when one of the bands on either side of the selected band reach maximum/minimum (±12.0 dB) before the selected band.

A convenient way to set up equalizer curves

> Store in the base memory, an equalizer curve, set in such a manner that the sound field in the car becomes flat, and adjusted to the frequency characteristics unique to your car. (It is recommended that adjustments be made after the dealer has taken measurements.) After recalling the base memory, making adjustments to suit your preference allows rapid creation of a well-balanced curve. See page 117 for memory operation.

Checking the equalizer effects

> Use the flat function to make the adjustment while confirming the effects. (See page 88.)

Equalizer adjustment for the subwoofer

> The equalizer adjustment for the subwoofer is conducted in front (when the subwoofer is connected to the front output, adjusting the rear has no effect).

> Equalizer adjustments to the front and rear function only when the subwoofer is connected to RS-P50 set up in NAC mode.

Equalizer adjustment for the center speaker

> The equalizer adjustment for the center speaker is conducted in front.

On completing adjustment

> Storing the equalizer curves into memory soon after completing adjustment is recommended. See page 117 for memory operations.

H2 Adjusting the 3 band parametric equalizer

❖ About the adjustment using the parametric equalizer

The parametric equalizer can make the following adjustments.

Separate 3 band adjustment for front/rear

It is possible to set up the front and rear equalizer curves separately. Among the 31 frequencies, three bands (frequencies) each can be selected to serve as the front and rear central frequencies, enabling level adjustments.

Frequency point: 20 Hz — 20 kHz (Every 1/3 octave, total 31 points)

Level adjustment range: –12 dB — +12 dB (1 dB/1 step)

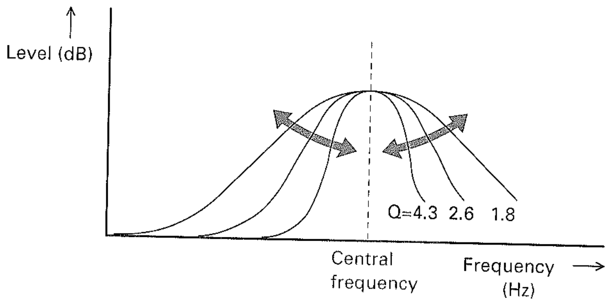
> Independent adjustments to the front or rear cannot be conducted with the following system configurations:
—When the system has only one RS-A1 or RS-A2 audio unit.
—When the fader for RS-A1 and RS-A2 is set up for either front or rear.

Q Select Function

Q factor (the inclination of the equalizer curve) in each band that serves as the central adjustment frequency can be selected separately.

Set values: 1.8, 2.6, 4.3 dB/oct.

The greater the value, the sharper the equalizer curve characteristics.

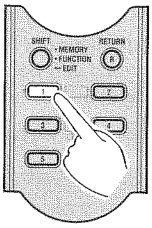


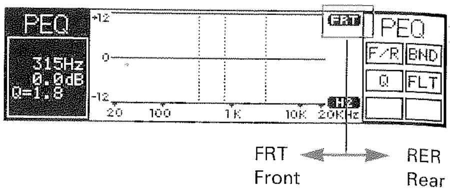
H2

❖ Setting the equalizer curve

1. Press Function button/1 to select front or rear.

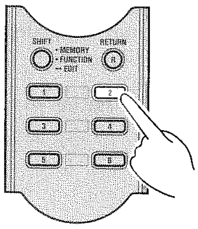
Press the button to switch between front and rear.

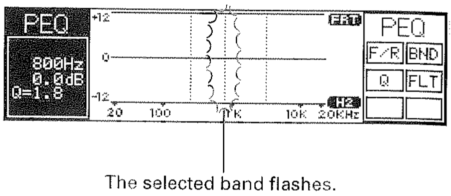

SHIFT
RETURN
• MEMORY
• FUNCTION
— EDIT


PEQ
315Hz
0.0dB
Q=1.8
+12
0
-12
20
100
1K
10K
20KHz
FRT
H2
PEQ
F/R
BND
Q
FLT
FRT
Front
RER
Rear

2. Press Function button/2 to select the band for adjustment.

Pressing the button switches to the following bands.

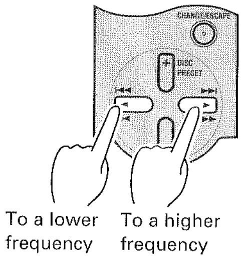

SHIFT
RETURN
• MEMORY
• FUNCTION
— EDIT

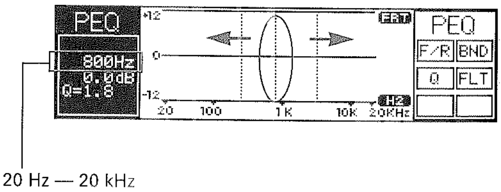

PEQ
800Hz
0.0dB
Q=1.8
+12
0
-12
20
100
1K
10K
20KHz
FRT
H2
PEQ
F/R
BND
Q
FLT
The selected band flashes.

3. Press the ◄ ► buttons to adjust to the desired frequency.

Holding down these buttons continues their operations.

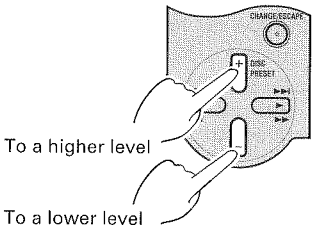
> It is not possible to set the difference between the two neighboring bands to less than 1 octave.

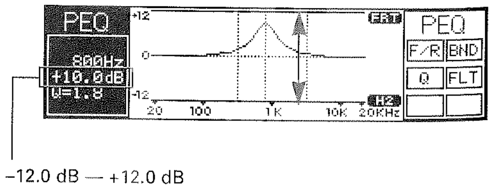

CHANGE/ESCAPE
DISC
PRESET
To a lower frequency
To a higher frequency


PEQ
800Hz
0.0dB
Q=1.8
+12
0
-12
20
100
1K
10K
20KHz
FRT
H2
PEQ
F/R
BND
Q
FLT
20 Hz — 20 kHz

4. Press the +/– buttons to adjust the level.

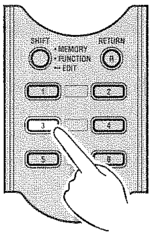
Holding down these buttons continues their operations (with one stop at the level of 0 dB).

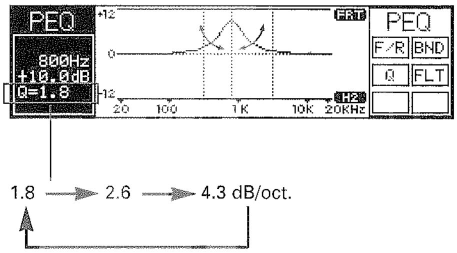

CHANGE/ESCAPE
DISC
PRESET
To a higher level
To a lower level


PEQ
800Hz
+10.0dB
Q=1.8
+12
0
-12
20
100
1K
10K
20KHz
FRT
H2
PEQ
F/R
BND
Q
FLT
–12.0 dB — +12.0 dB

5. **Press Function button/3 to adjust Q factor (inclination of equalizer curve).**

   Press the button to change the values in the following order. Set up the desired Q factor.





6. **Adjust other bands.**

   Repeat steps 2 — 5 to adjust to the desired sound.

7. **Switch between front and rear to set up the equalizer curve.**

   Repeat steps 1 — 6 to set up equalizer curves for the front and rear speakers separately.

A convenient way to set up equalizer curves

> Store in the base memory, an equalizer curve, set in such a manner that the sound field in the car becomes flat, and adjusted to the frequency characteristics unique to your car. (It is recommended that adjustments be made after the dealer has taken measurements.) After recalling the base memory, making adjustments to suit your preference allows rapid creation of a well-balanced curve. See page 117 for memory operation.

Checking the equalizer effects

> Use the flat function to make the adjustment while confirming the effects. (See page 88.)

Equalizer adjustment for the subwoofer

> The equalizer adjustment for the subwoofer is conducted in front (when the subwoofer is connected to the front output, adjusting the rear has no effect).

> Equalizer adjustments to the front and rear function only when the subwoofer is connected to RS-P50 set up in NAC mode.

Equalizer adjustment for the center speaker

> The equalizer adjustment for the center speaker is conducted in front.

On completing adjustment

> Storing the equalizer curves into memory soon after completing adjustment is recommended. See page 117 for memory operations.

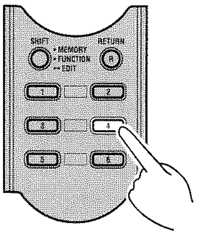
I2 / H2 The flat function <FLT> — common to 31/16B-GEQ and 3B-PEQ —

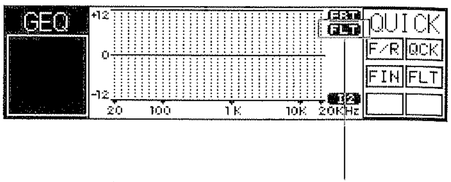
The adjusted equalizer curve can be temporarily returned to its prior status before making the adjustment (all levels are 0 dB), using the flat function.
This is convenient for checking the effects of the adjusted equalizer curve.

Press Function button/4 to turn ON the flat function.

Press the button again to cancel the function.

> When the flat function is on, the equalizer adjustment or memory operations of the equalizer curve can not be conducted.


SHIFT
RETURN
• MEMORY
• FUNCTION
•• EDIT
1
2
3
4
5
6


GEQ
+12
0
-12
20
100
1K
10K
20KHz
FRT
FLT
I2
QUICK
F/R
QCK
FIN
FLT

"FLT" is displayed when the flat function is ON.

NAC menu <NAC>

What is NAC (Natural Acoustic Control) ?

Music can sound different, depending on the place of the listener. This is because the sound the listener hears is determined by various factors (parameters), such as the dimensions of the room, including the distance from the wall, the height of the ceiling, and the materials of which it is constructed.

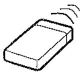
NAC (Natural Acoustic Control) is a high quality sound field control function which analyzes each parameter of the sound and adjusts that parameter to suit the characteristics of the sound and the human sense of hearing.
To create the optimum sound quality, two sound field modes are set up which faithfully and realistically reproduce the location and spaciousness of the original sound. Adjusting various parameters of these two sound field modes makes it possible to recreate every possible sound field.
Using digital signal processing technology that merits the title of "total sound field control", the listener can create a sound experience to satisfy his or her imagination, and so enjoy music to the fullest possible extent.

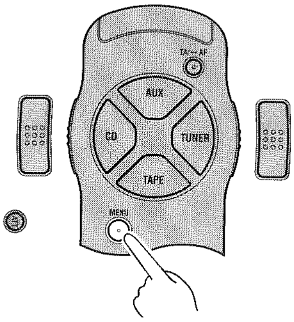
Switching to the NAC menu

Press the MENU button to switch to the NAC menu.

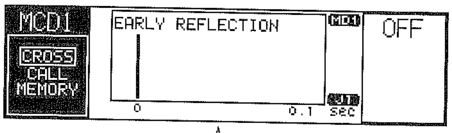
(See page 63.)

After the title screen, the display switches to the operations screen of the NAC menu. Opening and closing the cover of the SYSTEM COMMUNICATOR switches between the open and closed states of the menu display.

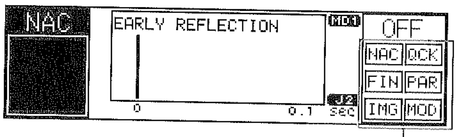




Closed state
J1: NAC basic screen (NAC-OFF)



Open state
Example: J2: NAC adjustment screen (NAC-OFF)



Function buttons display

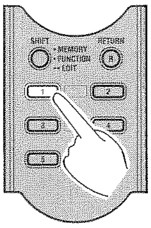
Canceling the NAC menu

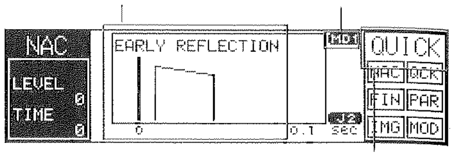
> Press the CHANGE/ESCAPE button to cancel the NAC menu (see page 63, "Canceling the audio menu").

Using NAC

❖ NAC ON/OFF

Press Function button/1 to switch between NAC ON/OFF.


SHIFT
RETURN
MEMORY
FUNCTION
EDIT
1
2
3
4
5


NAC
LEVEL 0
TIME 0
EARLY REFLECTION
MD1
QUICK
NAC
QCK
FIN
PAR
IMG
MOD
J2
0
0.1
sec

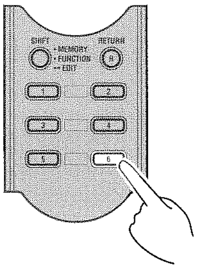
Current sound field status Selected sound field mode

OFF ⟷ ON (current adjustment mode is displayed (page 94))

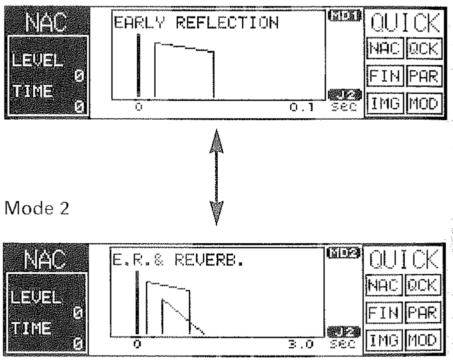
❖ Selecting sound field mode

NAC has two sound field modes: mode 1 and mode 2. These can be switched when NAC is ON.

Press Function button/6 to switch between mode 1 and mode 2.


SHIFT
RETURN
MEMORY
FUNCTION
EDIT
1
2
3
4
5
6

Mode 1


NAC
LEVEL 0
TIME 0
EARLY REFLECTION
MD1
QUICK
NAC
QCK
FIN
PAR
IMG
MOD
J2
0
0.1
sec
NAC
LEVEL 0
TIME 0
E.R.& REVERB.
MD2
QUICK
NAC
QCK
FIN
PAR
IMG
MOD
J2
0
3.0
sec

Mode 2

When operating NAC

> The NAC operations are performed when NAC is ON. (When NAC is OFF, NAC operations cannot be carried out, even when buttons are pressed.)

When switching sound field modes

> When the display shows J3: center image adjustment screen (page 103), it is not possible to switch the sound field mode. Switch between sound field modes after switching to quick adjustment mode or fine adjustment mode (page 94).

Making the most of NAC effects

> The NAC function can be used effectively by correctly setting up the time alignment function of the network menu (page 106) and the position selector function of the main menu (page 71).

> NAC recreates sound reflected from behind using the rear speakers. If there are no rear speakers in the system, the full NAC effects may not be obtained.

❖ Outline of two sound field modes

Mode 1 and mode 2, the two sound field modes which form the basis of NAC's sound reproduction, recreate the following sound experiences.

Mode 1 (Studio monitor room)

This mode recreates the monitor room of a recording studio in which music recordings such as CDs are mastered.
Using mode 1, the listener experiences the impression of the sound being produced in front, with early reflections from the wall of the monitor room after a short delay. In order to achieve a clear sound, no reverberation is added.

Mode 2 (Concert hall)

This mode recreates that most typical of all venues for the public performance of music, the concert hall. In a concert hall, various principles of audio technology are applied in order to give the music maximum impact.
In mode 2, rich reverberation provides the listener with a feeling of spaciousness, depth and smooth sound.

❖ NAC adjustment operations

NAC can recreate the basic sound fields using mode 1 and mode 2.
NAC also incorporates various refinements for mode 1 and mode 2. By making fine adjustments to suit one's individual taste and storing these adjustments in memory, the listener may fully enjoy their original sound field.

Parameter adjustment (page 92)

This adjusts various parameters of the early reflections and reverberations in a sound.

Center image control <IMG> (page 103)

This adjusts the apparent positions of vocalists performing live on stage in a concert hall.

Memory functions of each parameter adjusted (page 117)

Up to five parameter adjustments can be stored in memory. These stored settings may be easily retrieved from memory.

It is possible to turn NAC ON/OFF while making adjustments

> NAC adjustments are conducted by switching into several screens, depending on the type of adjustment being made. As it is possible to turn NAC ON/OFF from each adjustment screen, the listener may check the NAC effects while making the adjustments.

Before adjusting parameters

❖ Relationship between sound and hearing

The sounds we listen to in concert halls, jazz clubs and other venues are made up of those that reach us directly and those that are reflected and therefore reach us later. Reflected sounds can be classified into two types, based on differences in their characteristics.

Direct sounds

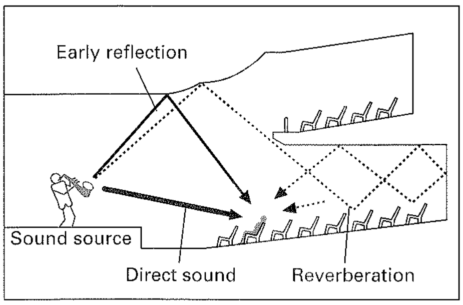
These are sounds which come to listeners directly from their source.

Early reflections: E.R.

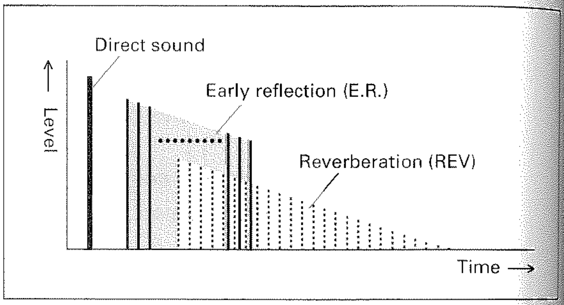
These are sounds which reach the listener several tens or hundreds of milliseconds after the direct sound. They have not been reflected off the walls and ceiling many times. E.R. sounds chiefly support direct sound and add a feeling of spaciousness.

Reverberations: REV

These are sounds that reach the listener from all directions after repeated reflection. The sound level decreases and the sound becomes diffused. They add a rich resonance to the total effect.



Sound type



The differences in time and level between direct and reflected sounds

Early reflections and reverberations have various parameters in their composition. NAC creates early reflections and reverberations for direct sound (sounds at each source) and adjusts their parameters. In this way, NAC fills the vehicle interior with realistic, richly resonant sounds.

Outline of NAC mode 1 and mode 2

> Sound mode 1 introduces early reflections without reverberation, producing a sound of crisp quality. Sound mode 2 adds rich reverberation, producing smooth, rich sound.

❖ Outline of parameters

The following parameters for early reflection and reverberation (mode 2 only) can be adjusted. For details, consult the "Parameter guide" (page 97).

Early reflection: E.R.

Parameter	Outline
E.R. initial delay (I.DELAY)	This adjusts the time between direct sound and the first early reflection.
E.R. level (LEVEL)	This adjusts the level of the total early reflection against the direct sound.
Room size (RM SIZE)	This adjusts the interval between early reflections. It is possible to change the apparent room size (spaciousness).
Liveness (LIVNESS)	This adjusts the difference between the first early reflection and the final early reflection. It is possible to change the resonance in the room.
H.F. reflection (H.F. REFL)	This adjusts the cut-off frequencies of the low pass filter, which reduces the high-range in the reflected sound.

Reverberation: REV (mode 2 only)

Parameter	Outline
REV initial delay (I.DELAY)	This adjusts the time between the direct sound and the first reverberation.
REV level (LEVEL)	This adjusts the level of reverberation against the direct sound.
Reverberation time (REVTIME)	This adjusts the time between the first and final reverberations, and is thus able to change the length of the reverberation.
H.F. reverberation (HF REV)	This adjusts the cut-off frequencies of the low pass filter, which reduces the high-range in the reverberation.
Reverberation fader (REV.FAD)	This adjusts the balance between front and rear reverberations.

The points when adjusting the parameters

> Increasing the level of early reflection (E.R.) and reverberation (REV) may cause some tracks to sound distorted because of the excessive NAC effect. Should this occur, decrease the E.R. level and the REV level or adjust the H.F. reflection or H.F. reverberation towards the negative side.

> If the level of the rear speaker is set below the initial value (see page 159), using the position fine tuning function on the main menu, the NAC may not be fully effective. Adjust NAC after returning the level of the position fine tuning function to its initial value.

Adjusting the parameters

❖ Two ways to adjust parameters

The following two methods can be used to adjust the parameters of early reflections and reverberations (mode 2 only).

Quick adjustment <QCK>

This function automatically adjusts, in particular proportions, several of the various parameters of early reflections and reverberations. This makes possible simple, well-balanced adjustment without loss of sound "naturalness". This method of adjustment does not require detailed knowledge of the sound parameters.

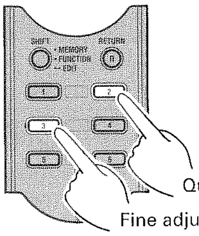
Fine adjustment <FIN>

This function separately adjusts each parameter of early reflections and reverberations, to create a sound individually tailored to the listener's taste.

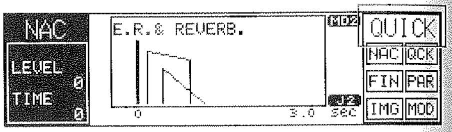
❖ Selecting adjustment mode <QCK> <FIN> J2

1. **Turn NAC ON and select mode 1 or mode 2.**
(see page 90.)
It is possible to make adjustments based on the selected sound field mode.

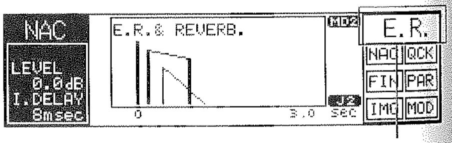
2. **Press Function button/2 or 3 to select quick adjustment or fine adjustment.**
This switches to each adjustment mode of J2: NAC adjustment screen.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6
Quick adjustment
Fine adjustment

J2: NAC adjustment screen (Quick adjustment)


NAC
LEVEL
0
TIME
0
E.R.& REVERB.
MD2
0
3.0
J2
sec
QUICK
NAC
QCK
FIN
PAR
IMG
MOD

J2: NAC adjustment screen (Fine adjustment)


NAC
LEVEL
0.0dB
I.DELAY
8msec
E.R.& REVERB.
MD2
0
3.0
J2
sec
E.R.
NAC
QCK
FIN
PAR
IMG
MOD

The target of current fine adjustment (E.R. or REV) is displayed.

Quick adjustment: Continue to the following page.

Fine adjustment : Continue to page 96.

After making adjustments

> Switching to sound field mode 1 or mode 2 will reset the NAC to the original values for each mode. It is therefore recommended that any adjustments are stored in memory soon after the adjustments have been completed. (See page 117 for memory operations.)

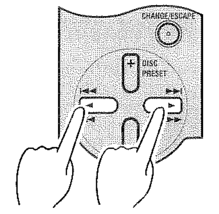
J2

❖ Quick adjustment

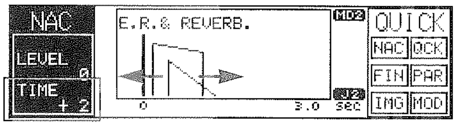
Continued from preceding page.

3. Press the ◀ ▶ buttons to adjust the time.

Parameters relating to the time of early reflections and reverberations (mode 2 only) are automatically adjusted.


CHANGE/ESCAPE
DISC PRESET
+

Shorter time period   Longer time period

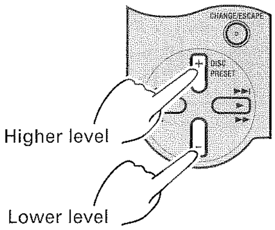

NAC
LEVEL 0
TIME + 2
E.R.& REVERB.
MD2
0
3.0 sec
J2
QUICK
NAC QCK
FIN PAR
IMG MOD

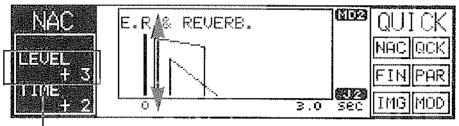
The step of the adjustment from the initial value is displayed.

4. Press the +/– buttons to adjust the level.

The level of early reflections and reverberations (mode 2 only) is automatically adjusted.

> When one of the parameters adjusted simultaneously reaches its maximum/minimum value, "Limit" is displayed and no further adjustment can be made.


CHANGE/ESCAPE
DISC PRESET
+
–
Higher level
Lower level


NAC
LEVEL + 3
TIME + 2
E.R.& REVERB.
MD2
0
3.0 sec
J2
QUICK
NAC QCK
FIN PAR
IMG MOD

The step of the adjustment from the initial value is displayed.

Parameters which can be adjusted using quick adjustment

During quick adjustment, the following parameters of early reflections and reverberations (mode 2 only) are adjusted. For details of the parameters, refer to the "Parameter guide" (page 97).

> Time adjustment
  ② E.R. initial delay
  ① Room size
  ② Reverberation time (mode 2 only)

> Level adjustment
  ① E.R. level
  ① REV level (mode 2 only)

Parameter ①: ±1 step with ±1 step of fine adjustment
Parameter ②: ±2 step with ±1 step of fine adjustment
The values of parameters other than those listed above cannot be changed using quick adjustment.

It is possible to make adjustments while switching between quick adjustment and fine adjustment

> When making adjustments in fine adjustment mode after completing quick adjustment mode, the time step and level step during quick adjustment return to 0.

> When switching to quick adjustment mode after completing fine adjustment mode, the values after adjustment in fine adjustment mode become time step 0 and level step 0 of quick adjustment. Consequently, the number of adjustable steps during quick adjustment changes.

J2

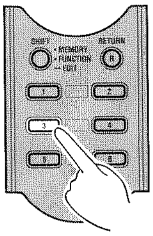
❖ Fine adjustment

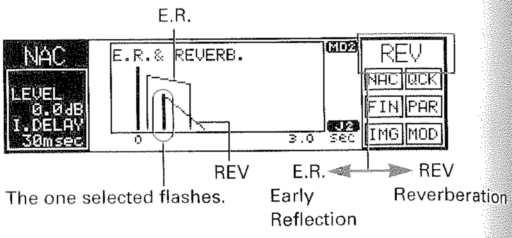
Continued from page 94.

3. **Press Function button/3 again to select from parameter adjustment for early reflection (E.R.) or parameter adjustment for reverberation (REV).**

Press the button to switch between E.R. adjustment and REV adjustment.

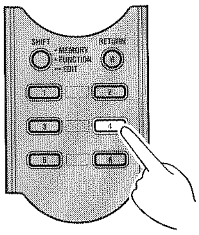
> When using mode 1 as the base, the display does not switch to REV adjustment.

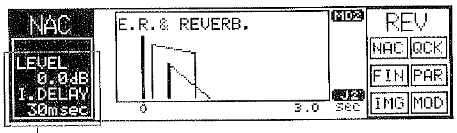

SHIFT
RETURN
• MEMORY
• FUNCTION
— EDIT
1
2
3
4
5
6


E.R.
NAC
LEVEL
0.0dB
I.DELAY
30msec
E.R.& REVERB.
MD2
J2
0
3.0
sec
REV
NAC
QCK
FIN
PAR
IMG
MOD
REV
The one selected flashes.
E.R. ◄► REV
Early Reflection
Reverberation

4. **Press Function button/4 to switch the parameters to be adjusted.**

Press the button to switch parameters in the following sequence:


SHIFT
RETURN
• MEMORY
• FUNCTION
— EDIT
1
2
3
4
5
6


NAC
LEVEL
0.0dB
I.DELAY
30msec
E.R.& REVERB.
MD2
J2
0
3.0
sec
REV
NAC
QCK
FIN
PAR
IMG
MOD

E.R. adjustment: LEVEL I.DELAY → LIVNESS RM SIZE → HF REFL

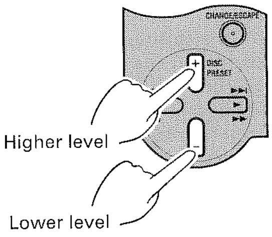
REV adjustment: LEVEL I.DELAY → (LEVEL) REVTIME → HF REV → REV.FAD

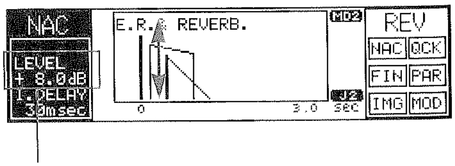
5. **Press the ◄ ► buttons and the +/– buttons to adjust each parameter.**

The indicated parameter can be adjusted by using either the ◄ ► buttons or the +/– buttons. (Time parameters can be adjusted using the ◄ ► buttons and parameters relating to sound level can be adjusted using the +/– buttons.)

> For details on the parameters, refer to the "Parameter guide" (following page).

Example: Level adjustment for reverberation


CHANGE/ESCAPE
DISC PRESET
Higher level
Lower level


NAC
LEVEL
+ 8.0dB
I.DELAY
30msec
E.R.& REVERB.
MD2
J2
0
3.0
sec
REV
NAC
QCK
FIN
PAR
IMG
MOD

–20.0 dB — +10.0 dB

Parameter guide

❖ Parameters of early reflections: E.R.

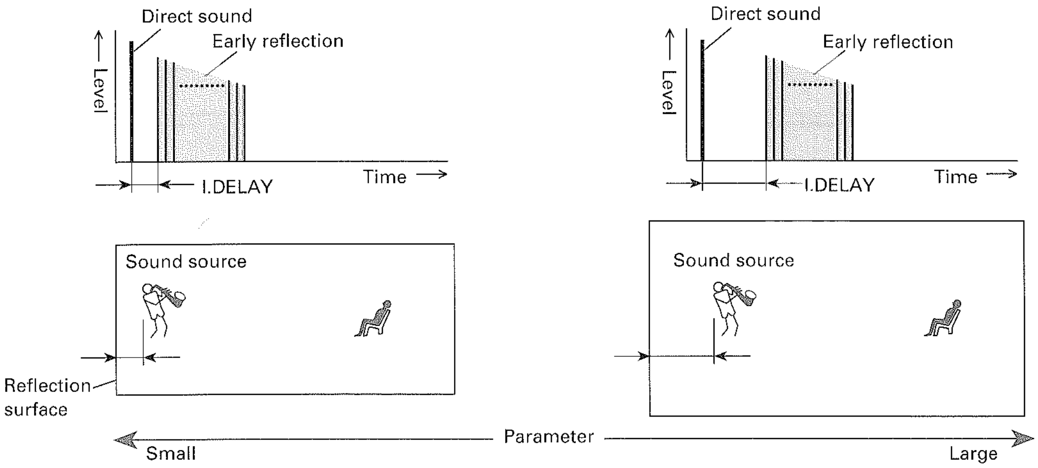
Early reflections have not been reflected many times by the time they reach the listener and mainly reinforce direct sounds. Adjusting early reflections makes it possible to alter the clarity of speech or lyrics, or change the degree of spaciousness of the sound.

E.R. initial Delay (I.DELAY)

2 msec. — 22 msec. (1 msec./1 step): Adjusted using the ◀ ▶ buttons.

This parameter adjusts the interval between the direct sound and the first early reflection reaching the ear of the listener.

The early reflection delay is determined by the difference in distance between the sound source and the reflection surface. Reducing the delay gives the listener the impression that the distance between the sound source and the walls has shrunk, creating a feeling of less resonance and spaciousness. By contrast, a greater delay increases the distance between the sound source and the walls, creating a feeling of greater resonance and spaciousness.

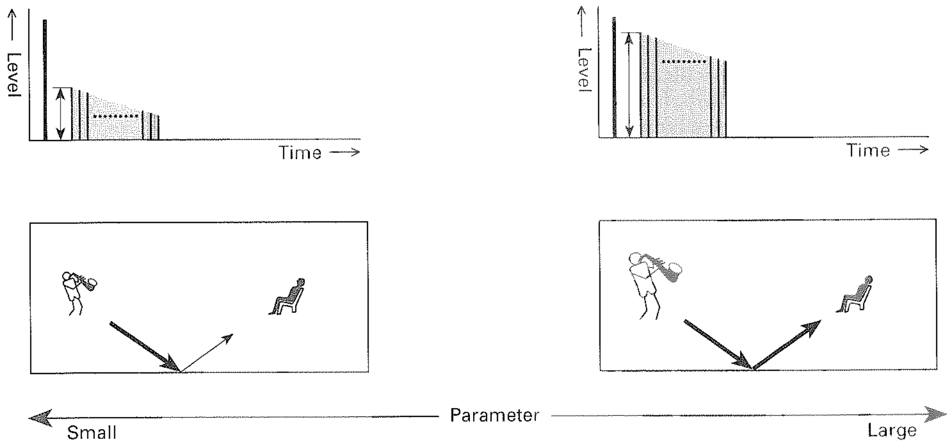

Direct sound
Early reflection
Level
I.DELAY
Time
Direct sound
Early reflection
Level
I.DELAY
Time
Sound source
Reflection surface
Sound source
Parameter
Small
Large

E.R. level (LEVEL)

MUTE, -20.0 dB — +5.0 dB (1.0 dB/1 step): Adjusted using the +/– buttons.

This parameter determines the magnitude of reflection relative to the direct sound. (This is displayed in the form of the difference in level from the initial values.)

Lowering the level reduces the echo as well as the sound image of the front. (When it is set to MUTE, the status becomes one without early reflections.) Raising the level increases the echo and slightly makes the front sound image larger. Note that this also affects the overall atmosphere of the sound field.



Room size (RM SIZE)

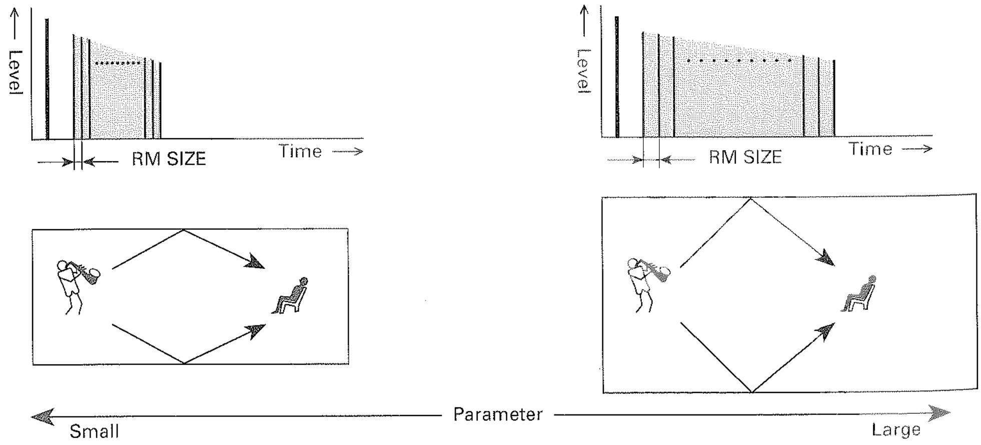
-10 — +10 (total of 21 steps): Adjusted using the ◀ ▶ buttons.

This parameter determines the apparent spaciousness of the room. It actually adjusts the time lapse between reflected sounds.

Reducing the values gives the listener the feeling that the listener is in a more confined space lacking echo and spaciousness. Raising the values gives a feeling of larger space surrounding the listener.

> When the sound from the sound source is repeatedly reflected, a larger distance between walls leads to a longer interval between reflected sounds. Therefore, adjusting the interval between reflected sounds can alter the feeling of spaciousness.

> When the values are increased in mode 2, increasing the reverberation time (page 101) also creates a feeling of greater spaciousness.



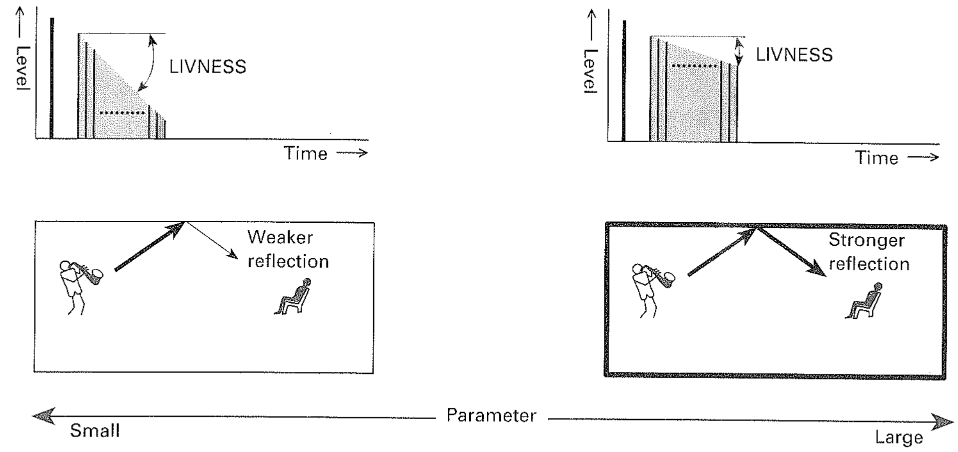
Liveness (LIVNESS)

–10 — +10 (total of 21 steps): Adjusted using the +/– buttons.

This parameter determines the degree of echo in the room (the feeling of "liveness" or "deadness"). It actually adjusts the attenuation characteristics of early reflected sounds.

Reducing the values weakens the echo (the sound becomes more "dead"). Raising the values increases the level of delayed reflected sounds, increasing echo and making the sound more "lively".

> The attenuation characteristics of early reflections in actual halls are determined by the sound absorption characteristics of the walls and other reflection surfaces, which are in turn determined by the materials of which these surfaces are made.



H.F. reflection (HF REFL)

–2 — +2 (total of 5 steps): Adjusted using the +/– buttons.

This adjusts the cut-off frequencies of the low pass filter, which reduces the high-range in the reflected sound. (When the frequency is lower or higher than the initial value, negative or positive numbers are displayed accordingly.)

Reducing the values creates soft, warm echo; increasing them creates a harder, more exact sound.

> The degree of reverberation, which depends on the construction material of the walls, determines the "liveliness" of the parameter. Sound absorption characteristics vary not only with materials but with frequency. Generally, high-ranges are readily absorbed and therefore attenuated, but middle and low-ranges are much less attenuated. H.F. reflection can adjust high-range attenuation characteristics independently from those in the middle and low-ranges.

❖ Reverberation parameters: REV (mode 2 only)

Reverberation generally refers to reflected sounds that follow early reflections. NAC is set up in such a way that reverberation is output to overlap early reflections.

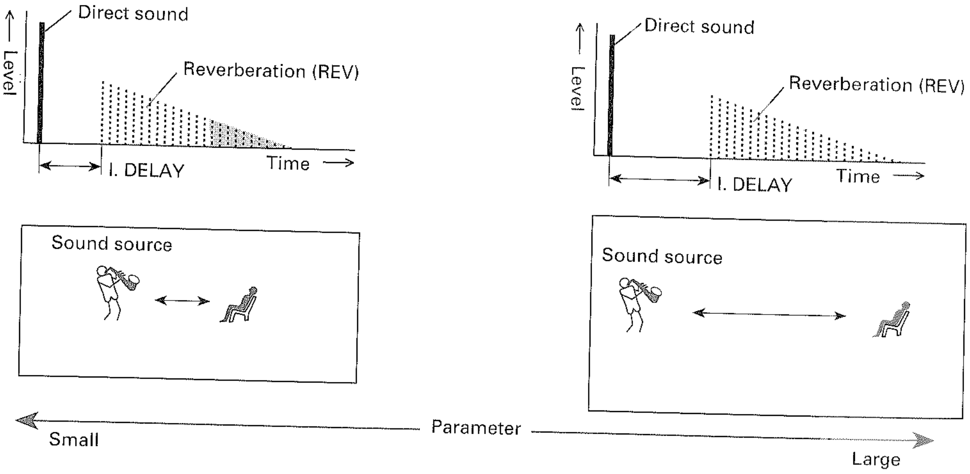
Reverberations are repeatedly reflected, with some absorption into the wall or other surface at each reflection. Reverberations therefore gradually attenuate, unlike direct sound. Furthermore, reverberations dissipates and reaches the listener from all directions. When reverberation is added, the sound further loses clarity, but gains in richness.

REV initial delay (I.DELAY)

30 msec. — 120 msec. (5 msec./1 step): Adjusted using the ◀ ▶ buttons.

This parameter adjusts the time interval from the direct sound to the start of reverberation.

Reducing this initial delay gives the listener the feeling of having moved closer to the sound source. On the other hand, increasing the initial delay gives the listener the feeling of having moved further away from the sound source. (If rear speakers are installed, this adjustment gives a feeling of additional space behind the listener.)

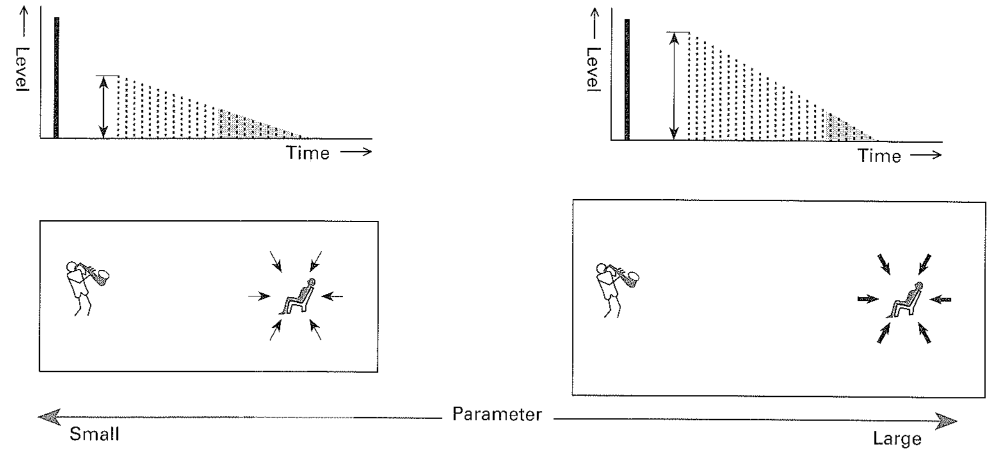

Direct sound
Reverberation (REV)
Level
I. DELAY
Time
Sound source
Direct sound
Reverberation (REV)
Level
I. DELAY
Time
Sound source
Small
Parameter
Large

REV level (LEVEL)

MUTE, -20.0 dB — +10.0 dB (1.0 dB/1 step): Adjusted using the +/– buttons.

This parameter determines the magnitude of reverberation relative to the direct sound (the difference in level from the initial values is displayed).

Lowering the level reduces reverberation and weakens the reflection off the wall. Furthermore, the sound image of the front becomes smaller and closer. (When it set to MUTE, no reverberation is heard.) Raising the level increases reverberation and strengthens the reflection off the wall. It also gives the impression that the distance between the listener and the sound image in the front has widened.



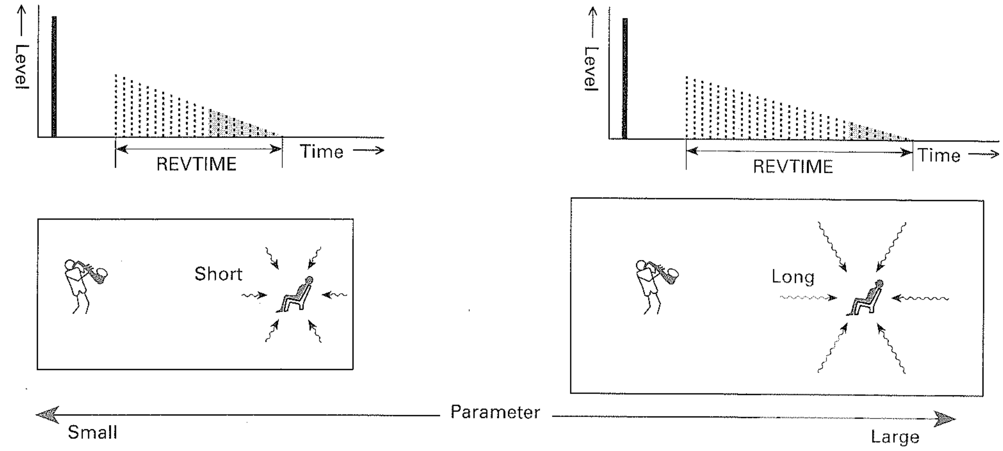
Reverberation time: REVTIME

400 msec. — 3,150 msec. (total of 19 steps): Adjusted using the ◀ ▶ buttons.

This parameter determines the length of reverberation. It adjusts the time over which the reverberation attenuates.

A decrease in the values shortens the reverberation length, giving the listener the feeling of being confined in a small space. By contrast, increasing the values lengthens the reverberation, giving the listener the feeling of more spacious surroundings.

> The reverberation time is based on the time taken by reverberation in the middle frequency range to attenuate by 60 dB. Depending on conditions in the vehicle and the values of the REV level, reverberation may become inaudible before it attenuates by 60 dB.



H.F. reverberation (H.F. REV)

-2 — +2 (total of 5 steps): Adjusted using the +/– buttons.

This adjusts the cut-off frequencies of the low pass filter, which reduces the high-range in the reflected sound. (When the frequency is lower than the initial value, a negative number is displayed, and when the frequency is higher than the initial value a positive number is displayed.)

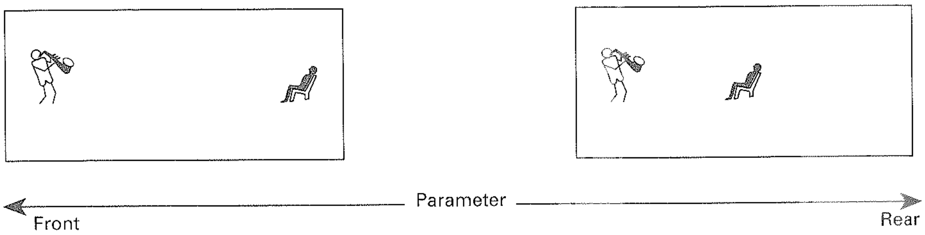
Reducing the value gives the listener the feeling of being closer to the sound source in a large space. By contrast, increasing the value gives the listener the impression of being distant from the sound source in a large space.

> As with H.F. reflection of early reflected sounds, it is possible to adjust the attenuation characteristics of high-range independently from those of middle and low-ranges, using H.F. reverberation.

Reverberation fader (REV.FAD)

This parameter determines the balance of the reverberation between front and rear.

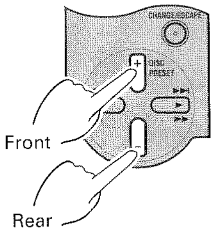
Shifting the emphasis to the front decreases reverberation from the rear speaker, giving the listener the feeling of being at the back of the room. Shifting the emphasis to the rear decreases reverberation from the front speaker, giving the listener the feeling of being near the front of the room.



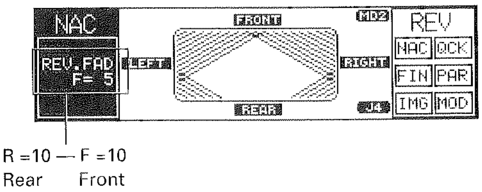
Shifting the reverberation parameter to reverberation fader switches the display into J4: reverberation fader adjustment screen.

Press the +/– buttons to adjust the reverberation fader.

Holding down these buttons continues their operations (with one stop at the center position).



J4: Reverberation fader adjustment screen



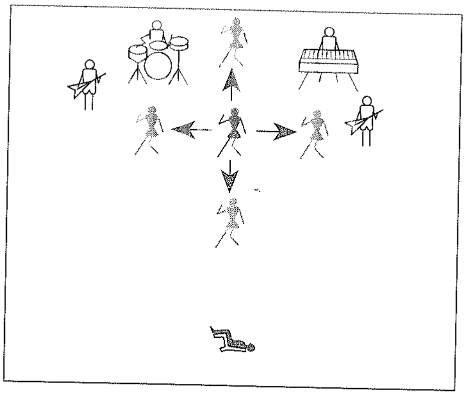
Examples of adjustment

> Adjusting each parameter of early reflection and reverberation can recreate such ambiences as those of a jazz club or stadium. Consult the attachment (page 160) for adjustment examples.

Using center image control <IMG>

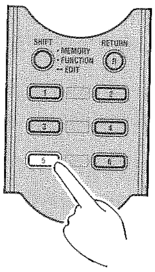
J3

This adjusts the apparent positions, relative to the listener, of singers performing in a concert hall.
The function enables the listener to emphasize one of the nearer singers or one at the back of the stage, giving the listener greater opportunity to enjoy the atmosphere of the performance according to his or her individual preference. Make the appropriate adjustment to suit mood and personal taste.

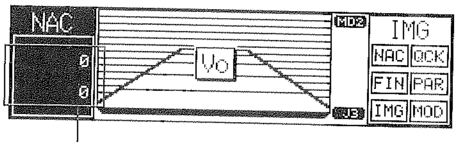


1. **Turn NAC ON and select mode 1 or mode 2.**
   (see page 90.)

2. **Press Function button/5 to switch to center image control mode.**
   The display switches to J3: center image adjustment screen.

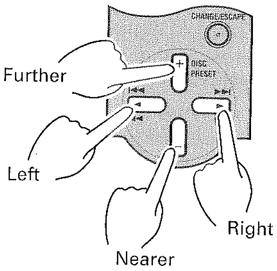

SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6

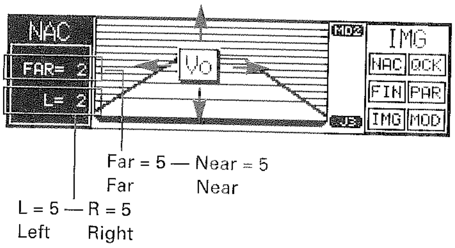
J3: Center image adjustment screen


NAC
0
0
Vo
MD2
J3
IMG
NAC
QCK
FIN
PAR
IMG
MOD

Current setup is displayed.

3. **Press the ◀ ▶ and +/– buttons to adjust the location.**


CHANGE/ESCAPE
DISC PRESET
Further
Left
Right
Nearer


NAC
Vo
MD2
J3
IMG
NAC
QCK
FIN
PAR
IMG
MOD
Far = 5 — Near = 5
Far
Near
L = 5 — R = 5
Left
Right

FAR= 2
L= 2

Effects are less conspicuous in the following case:

> When the level of early reflections and reverberations is decreased by adjusting NAC, the effect of center image control may be less noticeable.

Network menu <NETWORK>

What is the multi-amp system?

The multi-speaker system reproduces each frequency band (high, mid, low and ultrabass-ranges) through its own exclusive speaker unit. The multi-amp system provides an exclusive power amplifier for each speaker unit.

There is only limited space in a vehicle for installing speakers, and it is difficult to install large-diameter speakers in a door or on the dashboard and get high sound quality. To overcome this problem, a tweeters (high-range) are sometimes installed in the dashboard in order to move the sound image upwards, or the woofers are installed in the rear tray in order to improve low-range reproduction. Thus, using a multi-speaker system can correct imbalances in the sound image and significantly improve the total sound quality.

The multi-amp system offers the following features, allowing direct operation of the exclusive speaker unit for each frequency range by an exclusive power amplifier.

- It is possible to reduce the modulation distortion rate since high-range signals are not effected by strong signals in the low range.
- As it is possible to select amplifiers and speakers to suit the characteristics of each frequency range, the load on each unit is reduced, ensuring optimum performance.

Under the multi-amp system, it is necessary to divide the audio signals into each frequency range (band) and strictly control the set up conditions, using the network.

Under the ODR system, the audio unit incorporates a network. The following adjustments can be conducted within the vehicle.

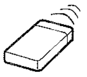
- Time alignment function ......adjusts for the difference in the distance between the listener and each speaker unit.
- Filter function ....sets up a low pass filter and high pass filter to decide the reproduced frequency band, the level and the phase of each speaker unit.

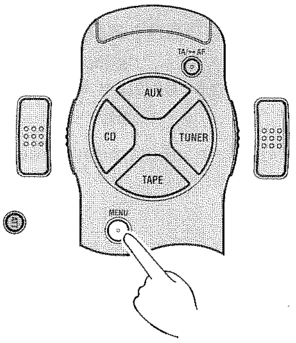
As the audio signals are processed in the form of digital signals when the network is working, the sound characteristics that best fit the vehicle interior may be created without any deterioration in sound quality.

Switching to the network menu K1 / K2

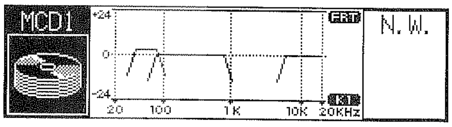
Press the MENU button to switch to the network menu.
(See page 63.)

After the title screen, the display switches to the operations screen of the network menu. Opening and closing the cover of the SYSTEM COMMUNICATOR switches between the open and closed states of the menu display.

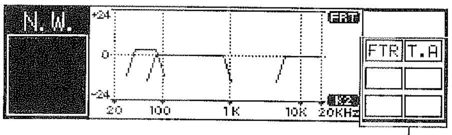




Closed state
K1: Network basic screen



Open state
K2: Network selection screen



Function buttons display

❖ Operations on the network menu

The following adjustments can be conducted on the network menu:

Time alignment adjustment <T.A> (page 106)

This adjusts the time period required for sounds from each speaker unit to reach the listener.

Filter adjustment <FTR> (page 111)

This adjusts the frequency band , levels, etc. of the signals input to each speaker units.

Memory functions of adjusted network (page 117)

The adjustments can be stored in memory. As the network menu has two kinds of memory, it is easy to switch different network characteristics.

Canceling the network menu

> Press the CHANGE/ESCAPE button to cancel the network menu (see page 63, "canceling the audio menu")

If adjustments are difficult

> Adjusting the network requires technical skills and knowledge of the amplifiers and speakers installed in the system. Consult your dealer from which the products were purchased if adjustments are difficult.

> When adjustments have already been made at your dealer, the optimum setup for vehicle's particular interior has already been installed in the base memory. In this case, recall this base memory for use (see page 117).

When completing the adjustments

> It is recommended that adjustment settings be stored in memory soon after the adjustments are completed. See page 117 for memory operations.

> After completing the network adjustments, adjust the overall balance of the sound image by using the position fine tuning function of the main menu as necessary (see page 73).

> When connecting a center speaker, adjust the center speaker filter on the main menu after completing the adjustment of the position fine tuning function (see page 68).

Time alignment adjustment

In the vehicle, the different speaker units are at widely differing distances from the listener. The sounds from the speakers therefore reach the listener at different times. When a multi-amp system is set up, this causes different delays for each frequency band (high, mid, low and ultrabass-ranges), marring the position of the sound image and the overall balance and disturbing the frequency characteristics.

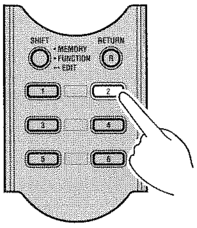
The time alignment function is able to synchronize the arrival times of the different sounds by delaying the output of signals from the closest speaker units.

K2

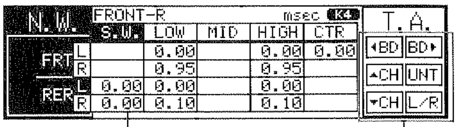
❖ Switching to the time alignment adjustment mode — K4

Press Function button/2 when the display shows K2: selection screen.

The display switches to K4: time alignment adjustment screen, allowing time alignment adjustment.



K4: Time alignment adjustment screen



FRONT-R msec

		S.W.	LOW	MID	HIGH	CTR
FRT	L		0.00		0.00	0.00
	R		0.95		0.95	
RER	L	0.00	0.00		0.00	
	R	0.00	0.10		0.10	

Function buttons display

Current setup is displayed.

❖ Calculating the distance to be corrected (delay time)

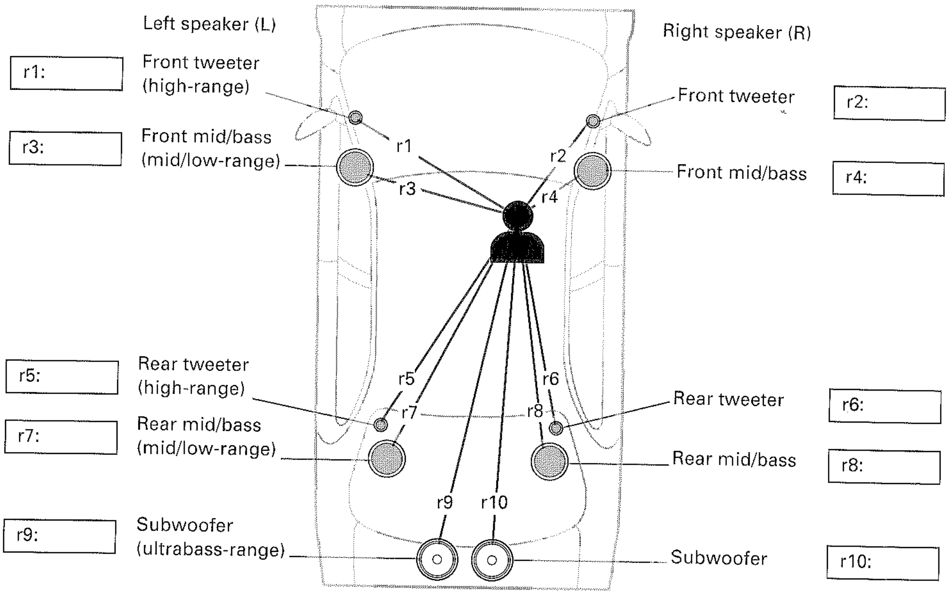
It is necessary to calculate the delay time to correct the time differences between speaker units. In order to adjust the time alignment function more easily, the ODR System allows the delay time to be set up by simply inputting the difference in the distance between speaker units (the distance to be corrected). (The delay time will be automatically calculated by ODR System.)

Although the distance from each speaker unit varies depending on the position of the listener, the first set up is made for the driver's seat. If the set up has been made for the driver's seat, the optimum delay time for the listener's position can be set up by simply switching the position selector function (page 71) to the listening position. (The ODR System automatically calculates and sets up the optimum delay time for each position.)

Example: making corrections for the driver's seat in a right-hand drive vehicle

1. Measure the distance between the head of the listener, when sitting in the driver's seat, and each speaker unit.

> The unit of distance must be either centimeters or inches.



Left speaker (L)
Right speaker (R)
r1:
Front tweeter (high-range)
r3:
Front mid/bass (mid/low-range)
Front tweeter
r2:
Front mid/bass
r4:
r1
r2
r3
r4
r5:
Rear tweeter (high-range)
r7:
Rear mid/bass (mid/low-range)
r5
r6
r7
r8
Rear tweeter
r6:
Rear mid/bass
r8:
r9
r10
r9:
Subwoofer (ultrabass-range)
Subwoofer
r10:

2. Calculate the difference in distance (the distance to be corrected) between the distance from the driver's seat to the farthest speaker unit and the distance to other speaker units.

① The farthest speaker unit from the driver's seat .... subwoofer (L)
② Distance between the subwoofer (L) and the driver's seat .... r9 (this measurement serves as the standard)
③ Difference in distance between r9 and other speaker units. (Input these values.)

Left speaker (L)		Right speaker (R)
D1 = r9 – r1 = ☐	(front tweeter)	D2 = r9 – r2 = ☐
D3 = r9 – r3 = ☐	(front mid/bass)	D4 = r9 – r4 = ☐
D5 = r9 – r5 = ☐	(rear tweeter)	D6 = r9 – r6 = ☐
D7 = r9 – r7= ☐	(rear mid/bass)	D8 = r9 – r8 = ☐
D9 = r9 – r9= 0	(subwoofer)	D10 = r9 – r10 = ☐

> After calculating the distance to be corrected, refer to the following page and input the correct distance.

When calculating the distance to be corrected

> It is recommended that the spaces marked ☐ be filled in as the measurements are made, as this information may prove useful at a later date.

> Calculate the distances to be corrected in the same manner for other systems than those used in the above example.

When connecting a center speaker

> Input the following values for the center speaker:
— Distance to be corrected: 272.0 cm or 107.2 inch
— Delay time: 8.00 msec.

It is also possible to input using the delay time

> The delay time is calculated by dividing the distance to be corrected, which has been worked out in procedure 2, by the speed of sound (C).
Example: T1 = D1/C
C: Approx. 343.5 cm/sec.
or approx. 135.2 inch/sec.

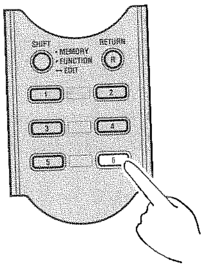
K4

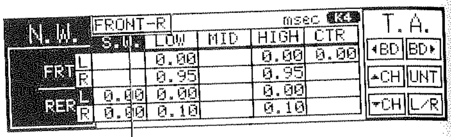
❖ Inputting the distance to be corrected (delay time)

Scope of adjustment: 0 – 10.00 msec. (0.05 msec./1 step)
0 – 340.0 cm (1.7 cm/1 step)
0 – 134.0 inch (0.6 or 0.7 inch/1 step)

1. **Press Function button/6 to select the driver's seat (position).**

Press the buttons to switch between "FRONT-R" and "FRONT-L". Select the position when calculating the distance to be corrected as shown on the previous page.
> The correct distance can not be input unless these operations are conducted.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
R
1
2
3
4
5
6


T.A.
◄BD
BD►
▲CH
UNT
▼CH
L/R

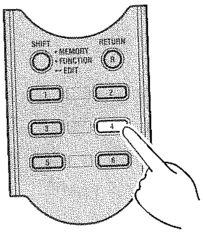
FRONT-R msec K4

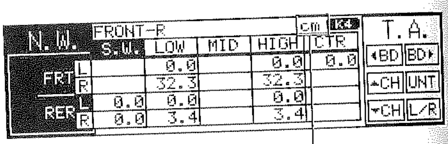
N.W.	S.W.	LOW	MID	HIGH	CTR
FRT L		0.00		0.00	0.00
FRT R		0.95		0.95	
RER L	0.00	0.00		0.00	
RER R	0.00	0.10		0.10	

FRONT-L ↔ FRONT-R
Left-hand drive / Right-hand drive

2. **Press Function button/4 to select the unit to be input.**

Select "centimeters" or "inches" when inputting the distance to be corrected, and select "milliseconds" when inputting the delay time.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
R
1
2
3
4
5
6

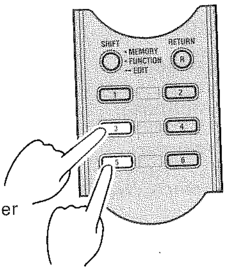

T.A.
◄BD
BD►
▲CH
UNT
▼CH
L/R

FRONT-R cm K4

N.W.	S.W.	LOW	MID	HIGH	CTR
FRT L		0.0		0.0	0.0
FRT R		32.3		32.3	
RER L	0.0	0.0		0.0	
RER R	0.0	3.4		3.4	

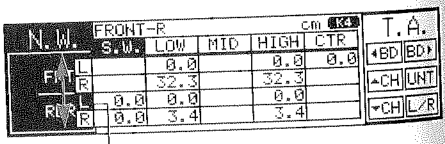
msec → cm → inch

3. **Press Function buttons/3, 5 to select the speaker channel to input.**


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
R
1
2
3
4
5
6

To the upper channel

To the lower channel


T.A.
◄BD
BD►
▲CH
UNT
▼CH
L/R

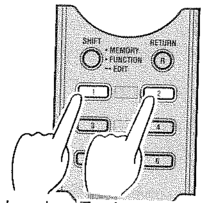
FRONT-R cm K4

N.W.	S.W.	LOW	MID	HIGH	CTR
FRT L		0.0		0.0	0.0
FRT R		32.3		32.3	
RER L	0.0	0.0		0.0	
RER R	0.0	3.4		3.4	

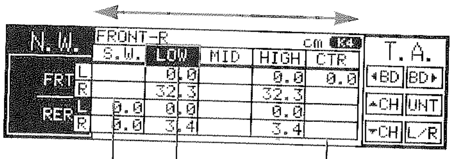
The selected channel is indicated in reverse.
FRT/L : Front left speaker
FRT/R : Front right speaker
RER/L : Rear left speaker
RER/R: Rear right speaker

4. Press Function buttons/1, 2 to select the band to input.

- > The display moves to the subwoofer only when selecting RER/L or RER/R channels.
- > The display moves to the center speaker only when FRT/L channel is selected.



To the left band To the right band



		S.W.	LOW	MID	HIGH	CTR
FRT	L		0.0		0.0	0.0
	R		32.3		32.3	
RER	L	0.0	0.0		0.0	
	R	0.0	3.4		3.4	

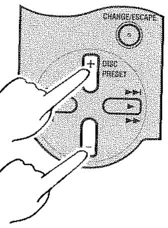
Does not move. Does not move.

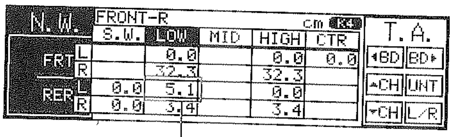
The selected band is indicated in reverse.

S.W. : Subwoofer (ultrabass-range)
LOW : Low-range speaker (low-range)
MID : Mid-range speaker (mid-range)
HIGH: Tweeter (high-range)
CTR : Center speaker

5. Press the +/– buttons to input the distance to be corrected (delay time).

Input the distance to be corrected, as calculated on page 107.





		S.W.	LOW	MID	HIGH	CTR
FRT	L		0.0		0.0	0.0
	R		32.3		32.3	
RER	L	0.0	5.1		0.0	
	R	0.0	3.4		3.4	

The values for the selected channel/band are adjusted.
0 — 340.0 cm (0 — 134.0 inch/0 — 10.00 msec.)

6. Carry out time alignment adjustments for the other speaker units.

Repeat steps 3 — 5 to input the distance to be corrected for each speaker unit.

Make appropriate adjustments for the system installed

- > Some systems may indicate values for speaker units which are not connected. Verify the composition of the system in order to correctly adjust the bands for the connected speaker units.

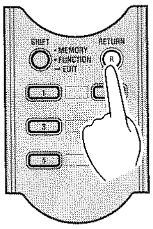
Adjusting the subwoofer

- > Even when the network mode of the Digital Amplifier RS-A1/A2 is set up in the S.W.-MONO (subwoofer monaural mode) and only one subwoofer is connected, values for RER/L and RER/R of S.W. are indicated. In this case, as the average values of the L channel and R channel are set up as adjusted values, input the measured value in both.

K4 ❖ Returning to the network selection screen

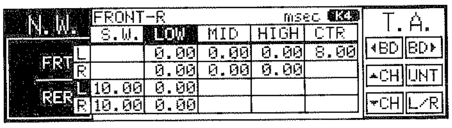
Press the RETURN button.

The display returns to K2: network selection screen.



When connecting other audio units to the optical output of RS-P50 which is set up in NAC mode:

> Set the following values for the delay time for each speaker unit. Setting other values will have no affect on delay time adjustment.
- — Subwoofer (when connecting the subwoofer to the RS-P50 RCA subwoofer output) → 10.00 msec.
- — Subwoofer (when connecting the subwoofer to the RS-P50 optical output) → 0.00 msec.
- — Center speaker → 8.00 msec.
- — The speaker connected to the RS-P50 optical output (front speaker) the measured values can be input.
- — The speaker connected to the RS-P50 RCA rear speaker output (rear speaker) adjustments have no effect.



		S.W.	LOW	MID	HIGH	CTR
FRT	L		0.00	0.00	0.00	8.00
	R		0.00	0.00	0.00	
RER	L	10.00	0.00			
	R	10.00	0.00			

> Set the delay time adjustment of the position fine tuning function (page 73) to the rear side's max. value (10.00 msec.).

Filter adjustment

The following adjustments can be made during filter adjustments. Make the appropriate adjustments for the reproduced frequency band and characteristics of the connected speaker unit.

Filter frequency adjustment: every 1/3 octaves
Level adjustment: 0.5 dB/1 step

The cut-off frequencies of the high pass filter (H.P.F.) and the low pass filter (L.P.F.) of each band (subwoofer, low, mid, high) and the reproduction level of each band are set up.

	Cut-off frequency of H.P.F.	Cut-off frequency of L.P.F.	Level adjustment range
Subwoofer-range	20 Hz — 100 Hz	25 Hz — 250 Hz	–24 dB — +10 dB
Low-range	25 Hz — 250 Hz	250 Hz — 10 kHz	–24 dB — 0 dB
Mid-range	200 Hz — 10 kHz	2 kHz — 20 kHz	
High-range	1.6 kHz — 20 kHz	8 kHz — 20 kHz	

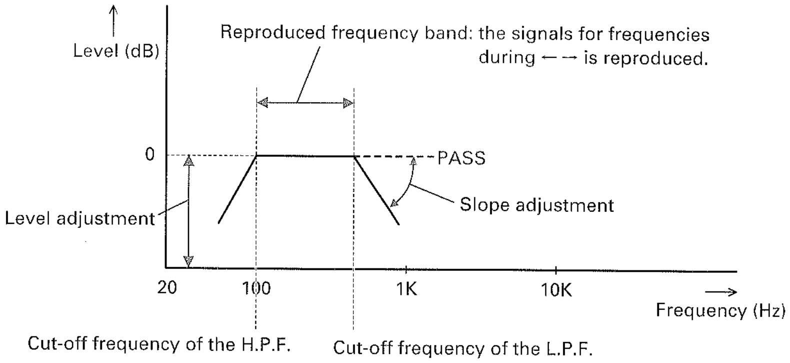
Slope adjustment: PASS, –6 dB/oct. — –36 dB/oct. (every –6 dB/oct., total of 6 steps)

The slope (inclination of attenuation of filter characteristics) of H.P.F. and L.P.F. is set up.

> When the slope is set as PASS, the audio signals bypass the filter circuit, cutting out the effect of the filter circuit.

> In order to protect the speaker unit, H.P.F. has no PASS set up for mid and high ranges.

Phase adjustment: normal/reverse


Level (dB)
Reproduced frequency band: the signals for frequencies during ←→ is reproduced.
0
PASS
Slope adjustment
Level adjustment
20
100
1K
10K
Frequency (Hz)
Cut-off frequency of the H.P.F.
Cut-off frequency of the L.P.F.

About the H.P.F. and L.P.F.

> High pass filter eliminates lower sound ranges (low-range) from the set up frequencies and allows high ranges through.

> Low pass filter eliminates upper sound ranges (high-range) from the set up frequencies and allows low ranges through.

Slope

> This value indicates how many dB the signals attenuate when the frequency increases (or decreases) 1 octave (unit: dB/oct.). Increasing the degree of the slope increases the degree of signal attenuation.

When using the full range speaker

> Setting the slope of H.P.F. and L.P.F. of the low-range as PASS creates a full range setup.

Filter adjustment of the center speaker

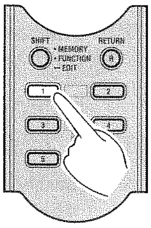
> The filter adjustment of the center speaker cannot be conducted on the network menu. Conduct the adjustment on the main menu (see page 68).

K2

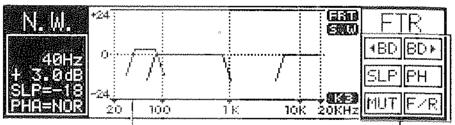
❖ Switching to filter adjustment mode K3

Press Function button/1 when the display is K2: network selection screen.

The display switches to K3: filter adjustment screen, allowing filter adjustments.


SHIFT
RETURN
• MEMORY
• FUNCTION
• EDIT
1
2
3
4
5

K3: Filter adjustment screen


N. W.
40Hz
+ 3.0dB
SLP=-18
PHA=NOR
+24
0
-24
20
100
1K
10K
20KHz
FRT
S.W
K3
FTR
◂BD
BD▸
SLP
PH
MUT
F/R

Function buttons display

The current setup is displayed.

K3

❖ Using the MUTE function

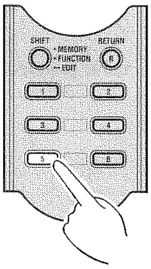
It is possible to turn the MUTE function ON/OFF for each band of the front/rear speakers. Turning ON the MUTE function stops the sound output for that band. Adjust the filter while turning the MUTE function ON/OFF as necessary.

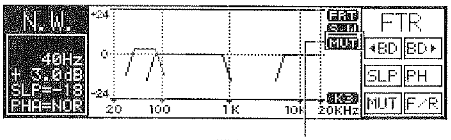
1. **Select the band for which the MUTE function is to be turned ON.**

   To select a band, consult "Adjusting the filter" on the following page.

2. **Press Function button/5 to turn the MUTE function ON.**

   Press the button to switch ON/OFF.


SHIFT
RETURN
• MEMORY
• FUNCTION
• EDIT
1
2
3
4
5
6


N. W.
40Hz
+ 3.0dB
SLP=-18
PHA=NOR
+24
0
-24
20
100
1K
10K
20KHz
FRT
S.W
MUT
K3
FTR
◂BD
BD▸
SLP
PH
MUT
F/R

"MUT" is displayed when the MUTE function is turned ON.

Before making filter adjustments

- When the position is set up for the driver's seat after adjusting the delay time of the time alignment function (page 106), it is recommended that filter adjustments be made.
- Store the different filter characteristics into memory, by the listening position set up with the position selector function (page 71) or by the source being listened, and switch when necessary. See page 117 for memory operations.

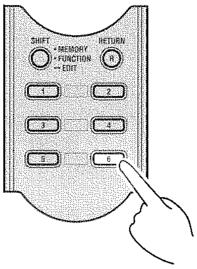
K3

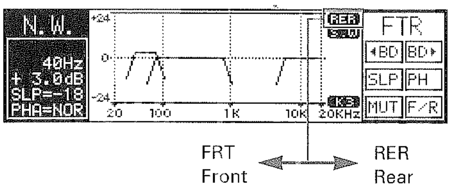
❖ Adjusting the filter

First, determine the approximate band to be used, taking into consideration the reproduced frequency band and the characteristics of the connected speaker.

1. Press Function button/6 to select front or rear.

Press the button to switch between front and rear.


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6


N.W.
40Hz
+ 3.0dB
SLP=-18
PHA=NOR
+24
0
-24
20
100
1K
10K
20KHz
RER
S.W.
K3
FTR
◂BD
BD▸
SLP
PH
MUT
F/R

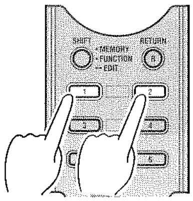
FRT
Front

RER
Rear

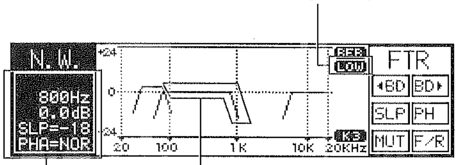
2. Press Function buttons/1, 2 to select the filter to be adjusted.

Press the button to switch the band to be adjusted and high pass filter/low pass filter.

The selected band is displayed.
S.W. : subwoofer-range
LOW : low-range
MID : mid-range
HIG : high-range


SHIFT
MEMORY
FUNCTION
EDIT
RETURN
1
2
3
4
5
6

To the left To the right


N.W.
800Hz
0.0dB
SLP=-18
PHA=NOR
+24
0
-24
20
100
1K
10K
20KHz
RER
LOW
K3
FTR
◂BD
BD▸
SLP
PH
MUT
F/R

The selected filter flashes.

The current setup of the selected band (filter) is displayed.

Continued overleaf.

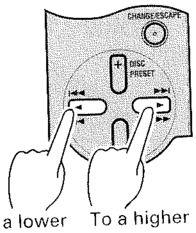
Filter adjustment of the subwoofer

> Adjusting the filter of the subwoofer can be conducted for both front and rear.

> Adjustments of the cut-off frequency of the low pass filter and levels can also be carried out on the main menu (see page 68).

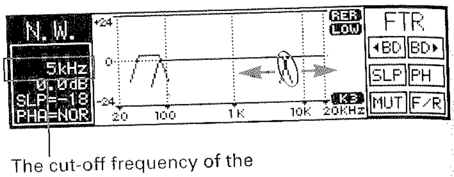
3. Press the ◀ ▶ buttons to set up the cut-off frequency of the selected filter (crossover frequency).

Holding down these buttons continues their operations.


CHANGE/ESCAPE
+
DISC
PRESET

To a lower frequency

To a higher frequency


N.W.
5kHz
0.0dB
SLP=-18
PHA=NOR
+24
0
-24
20
100
1K
10K
20KHz
REF
LOW
K3
FTR
◀BD
BD▶
SLP
PH
MUT
F/R

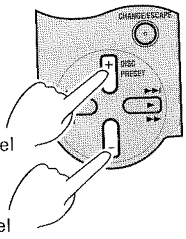
The cut-off frequency of the adjusted filter is displayed.

4. Set up the cut-off frequencies of each filter for all the bands.

Repeat steps 2 and 3 to adjust each filter so that the band used and crossover frequency are appropriately located.

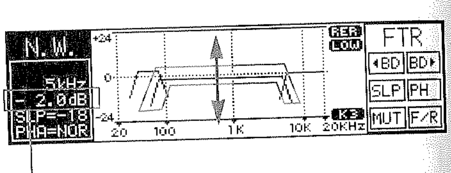
5. Press the +/– buttons to adjust the level of each band.

Holding down these buttons continues their operations.
Switch to each band and adjust the level in order to create a better overall balance.


CHANGE/ESCAPE
+
DISC
PRESET

To a higher level

To a lower level


N.W.
5kHz
- 2.0dB
SLP=-18
PHA=NOR
+24
0
-24
20
100
1K
10K
20KHz
REF
LOW
K3
FTR
◀BD
BD▶
SLP
PH
MUT
F/R

The current level is displayed.

Important points in adjusting cut-off frequencies

> If the subwoofer is installed in the rear tray, setting a high cut-off frequency of L.P.F. of the subwoofer separates the bass and gives the listener the feeling that the bass is coming from behind.
The L.P.F. of the subwoofer is recommended to be set at 100 Hz or below.

> Speakers used for mid and high-ranges are generally constructed handle a limited level of input compared to low range speakers. If the cut-off frequency of H.P.F. is set lower than necessary, strong bass signals can reach the speaker and may damage it.

Important points in adjusting the level

> The low band, because of its sound frequency characteristics, incorporates the basic frequencies of many musical instruments. It is recommended that the level adjustment of the low band be made first, and then the level adjustment of the mid, high, and subwoofer be made in that order.